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4.

THE ORCHARD.

15-25

THE

ORCHARD & FRUIT GARDEN,

including the Forcing Pit,

BY

CHARLES McINTOSH, C.H. F.L.S.

AUTHOR OF THE GREENHOUSE.

London:
PUBLISHED BY Wm S. ORR & Co AMEN CORNER,
PATERNOSTER ROW.
1839.

1525—

THE
ORCHARD:

INCLUDING

THE MANAGEMENT OF WALL AND STANDARD

Fruit Trees,

AND

THE FORCING PIT;

WITH SELECTED LISTS AND SYNONYMES OF THE MOST CHOICE VARIETIES.

BY CHARLES M'INTOSH, C.F.C.H.S.,

HEAD GARDENER TO HIS GRACE THE DUKE OF BUCCLEUCH, AT DALKEITH.

LONDON:
WM. S. ORR AND CO., AMEN CORNER,
PATERNOSTER ROW.

MDCCCXXXIX.

1839

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GIFT OF
JAMES STURGIS PRAY
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Upon no subject connected with Horticulture has more been written than upon the cultivation of Fruit Trees,—a fact to which the shelves of the author's library, in common with those of most other gardeners, bear ample testimony.

But, although cheerfully granting to his predecessors in this walk their full meed of praise for the valuable materials laid open in their writings, from which the author has derived both pleasure and instruction, he cannot help lamenting that, with a very few exceptions, one of the most important subjects in Pomology has been hitherto much neglected,—the nomenclature of the science has long been a disgrace to the Horticultural literature of our country.

Feeling this deficiency, he has been induced to compile the following little volume, on which he has expended much time and research, with the hope, in some measure, of applying to it a remedy. The principal feature of the work, therefore, is the Select Lists of the various kinds of fruit, with the copious synonymes attached thereunto. The author believes that they contain all the sorts really worth cultivation. He has admitted none but varieties of the highest character, and such as will repay the cultivator for his trouble and expense. The selections have been made for the latitude of London:

planters will therefore make the necessary allowance, if they live in a higher or lower latitude.

The subject has everywhere been treated in a popular manner; technicalities and theoretical views have been avoided; and the directions laid down have been verified by the results of twenty years' experience in an extensive field of operations. Where established authorities coincided with his own views, the author has not scrupled freely to quote them.

The distance of the author from the press has prevented him from revising many of the proof-sheets, which has opened the door to a few typographical errors. As, however, they in no instance materially affect the sense, he has not deemed it necessary to particularize them.

Dalkeith Palace, June, 1839.

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THE
ORCHARD
C. F. Sargent.
DONNER Z.

The earliest notice of British Pomology is that by Richard Arnold, a citizen of London, who published his "Chronicles" in 1502, in which work he dedicates a chapter to "*The crafte of graffynge and plantynge and alterynge of fruits, as well in colour as in taste.*" The art of grafting, including the amelioration of fruits, is the subject principally treated of in this work — a proof that the science had attained some degree of advancement even at this early date.

Arnold, as a Pomological author, was followed by Sir Hew Platt, Mascall, Gerard, Lawson, Parkinson, Tusser, Bacon, Hartlib, Coles, Austen, Beales, Evelyn, Drope, Laurence, Langford, Facio, London and Wise, Switzer, Bradley, Miller, Langley, Justice, Hitt, Abercrombie, Gibson, Boutcher, Preston, Speechly, Forsyth, Salisbury, Knight, G. Lindley, Lyon, Hayward, Harrison, Dr. Lindley, Rogers, and last, but certainly not least, Mr. Robert Thompson, of the Horticultural Society of London, who has done more, particularly in the arrangement of the nomenclature of fruits, than all the others together.

It will naturally be supposed that among so many authors an immense mass of information must have accumulated on this subject. This is to a certain extent true: but prior to the publications of Speechly, Forsyth, and Salisbury, little can be gleaned which is found of practical utility to the Pomologist of the present time. Knight, Lyon, Hayward, and Lindley have treated the subject physiologically; and to the former of these in particular every horticulturist is deeply indebted.

Pomology, therefore, as an inductive science, can only be said to have originated in the present century, and has made rapid strides towards perfection in that brief space of time. The physiological department has been elaborately elucidated by Knight and others, and the reduction of the nomenclature to something like fixed principles, a task of infinite utility, has been ably performed by Mr. George Lindley, Professor Lindley, and Mr. Robert Thompson. It must, however, be admitted, that notwithstanding their united labours, and the facilities for investigation possessed by the two latter, from trees and fruits growing in the same garden, together with the advantage of a library containing all that has been published on the subject, much yet remains to be determined in regard to names to enable the cultivator to select the best sorts from the many inferior ones at present in cultivation.

The botanist has permanent and highly marked characters by which he can describe and distinguish different species of plants from each other; but the shades of difference between fruits are in general so slight, and these so liable to be changed by soil, situation, climate, and cultivation, that it is often difficult to find sufficiently permanent characteristic marks by which one fruit may be distinguished from another. "Some individuals," as Mr. Loudon very justly observes, "who have cultivated, fruited, or studied extensive collections of apples, pears, or plums, may know at sight a considerable number of varieties; but in general only a very few sorts are known by one individual; and in the great majority of cases a gentleman's gardener can speak with confidence regarding those sorts only which are under his care. The reason of this is, that the shades which distinguish varieties are so fleeting as not to be retained in memory, or only retained to a very limited extent. An apple may be distinguished from twenty other apples all very much alike, when the whole twenty are placed together before the eye; but any one of the twenty, taken apart, and delineated and described, however perfectly, will hardly present any marks sufficiently distinctive to be remembered, and by which it may be recognized with any degree of certainty." The same authority proposes a very ingenious and no doubt a very excellent mode of delineating, not only the fruits themselves, whole and in sections, but also the flowers, leaves, young and old wood, as well as the natural habit of the full grown tree. Such an elaborate work, if ever executed upon the plan recommended, would not only be very expensive, but would require years to complete it, or rather, in fact, could never be completed, on account of the annual appearance of new, or the recognition of old and unknown sorts, which will ever be taking place.

The new edition of Poiteau and Turpin's Duhamel, which is somewhat on the above plan, is subject to the same objections, so far as either is considered useful to the general reader. Besides, in the latter work, as well as in most others on Pomology, too many worthless and inferior fruits have been admitted, and sufficient attention has not been paid to synonymes. The Pomological Magazine, Lindley's Guide, and the Fruit Catalogue of the Horticultural Society of London, have done much good in this latter respect; and we trust that our humble endeavours to follow up the same object in the following pages will not be found altogether useless. We have limited our lists of sorts to what we consider a selection of the most approved and valuable, either for early ripening, long keeping, productiveness, or some other peculiar merit. The routine of culture will also be treated on as lucidly as possible, as well as every subject which can be considered of practical utility to the fruit gardener. But all these subjects, important as they are, are subordinate, in the present state of horticultural knowledge, to correct nomenclature; for without this no system of culture can be proceeded in on fixed principles, because the treatment which suits one variety of fruit may be injurious to another, nor can a remedy be applied while such confusion exists in regard to names as is too well known to be the case at present.

The inconveniences to which the cultivator is subject, owing to the present defective state of nomenclature, are innumerable. One of these may be instanced in the case of the Grosse Mignonne peach, one of our very best French sorts, and one which ought to find a place not only in every garden in Britain, but in every forcing-house where peaches are grown. Yet, such is the confusion in regard to nomenclature in this case that this excellent fruit is sold in the nurseries and cultivated in many gardens under no less than *thirty-three* (!) different names; the Bellegarde under *eight* or *nine*, and the equally excellent Late Admirable under *nine* or *ten*, and so of some others. The consequence of this is, that after a gentleman has purchased perhaps fifty peach trees under different names, with a view of obtaining a selection of the most valuable sorts, and after he has undergone all the expense of planting and cultivating, and the trees have come into a bearing state, he may find that, instead of a collection of fifty sorts, which ought to prolong the season of this fruit to its greatest extent, he is in possession of *three sorts only*, which, although excellent in themselves, afford him neither much variety nor a sufficiently early and late supply for his table.

On this subject Mr. Loudon offers the following judicious remarks:—"There are probably not half so many distinct sorts as there are names in use; and of that half, most likely two thirds are not worth cultivating. Of most of the sorts originated from seed, sufficient time has not elapsed to judge of their merits; they are all described as good; but unquestionably many of them are worth little in comparison with the best old sorts. Some of the cherries and peaches might be adduced as examples: and the Poonah grape, lately imported from the East Indies, and stated to be 'a valuable addition to our gardens,' has been in the country (in the Brompton Nursery, for example,) an unknown length of time, under a different name, and scarcely worth cultivating."

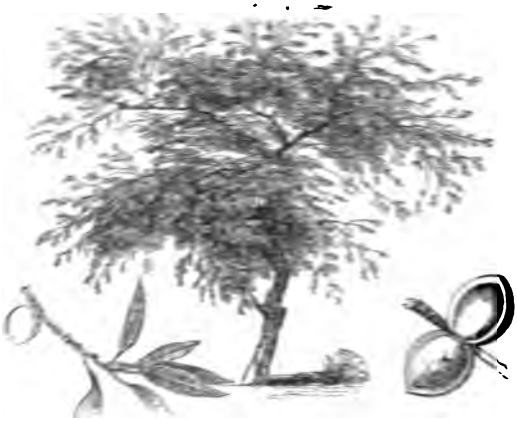
In forming collections of fruits, it will always be found more satisfactory not to attempt too great a number of sorts, and to endeavour to fix upon those that are already well known, and also such as are found to suit the latitude and circumstances of the situation. There has unfortunately been a kind of mania for collecting endless varieties of fruits, and in many cases some of our oldest and best sorts have been cast out of gardens, or cut down and grafted with others far inferior to them in every respect. Many French and American fruits have been also introduced, which, though perhaps excellent in their native climate, are quite unfit for many parts of Britain. These fruits, consequently, have not only fallen into considerable disrepute from incongeniality of climate, but the proprietor has sustained a serious loss. As to such fruits as strawberries, gooseberries, &c., which bear early, the disappointment is of little consequence, because a year or two at most will rectify the mistake; but in the case of apples, pears, cherries, plums, &c., which require a number of years to bring them into a bearing state, the disappointment becomes serious. Suppose, for example, that a Crassane pear is intended to be planted, but, from inaccurate nomenclature, a Crawford or some equally worthless sort should be purchased and planted instead,—and few could detect it until the appearance of the fruit—there is not only a very serious loss of time before the error is detected, but a great additional delay in bringing the desired variety into a state of productiveness.

In considering the propriety of making selections of the best kinds of fruits, we find Mr. Nicol, even in his day, complaining of the mania for collecting varieties. "I have long made it my business," he says, "to persuade my employers, in the planting of new gardens and orchards, to limit the varieties of fruit, in the firm conviction that I was acting for their interest; for certainly the rage for multiplying them, and of having a numerous collection, has too much prevailed of late. It were better to be contented with a few good kinds, that produce well in most seasons, than to plant many sorts for the sake of variety, of which a crop is obtained, perhaps, once in three or seven years. It is no doubt of very great importance to select and adapt the kinds to the climate, soil, and aspect; and in some situations a greater variety may be planted with propriety than in others. This matter must be determined by existing circumstances, by the fancy of the proprietors, and by the discretion of the gardener."

Some attention should be also paid to selecting sorts suitable to their destined soils, as some that would succeed well in a strong clay would languish in a poor, light, sandy soil; and others that would ripen to perfection in the south of England would not succeed in the north of Scotland. For example, the fig is grown as a standard in almost as great perfection in some parts of Sussex as it is on the opposite coast of France; but who would ever expect it to attain the same perfection in Ross-shire or Caithness? The golden pippin and nonpareil apples ripen well as standards in the warmer parts of England, but require the protection of walls in most parts of Scotland.

There are some situations where the apple and pear thrive well, while the cherry and plum do not; the cultivation of the two former should therefore be encouraged, while that of the latter should be only so to a limited extent; and the same may be said of certain kinds even of apples and pears which appear to succeed in some localities, beyond which they are neither healthy nor productive. The observing planter should therefore select the former, if his object be a certain and abundant produce; and the latter only for the purpose of studying the cause physiologically.

"In planting orchards," Phillips very justly remarks, "we attend more to the fruits that please our fancy, than to kinds that are more congenial to our soil and situation; thus we often see pear trees unfruitful where apples might be produced, and *vice versâ*. Columella notices 'apple-bearing Tibur,' and Virgil, 'those whom the walls of apple-bearing Abella look down upon.' Indeed, throughout the writings of these authors we are reminded that particular spots were set apart for particular plants." May we not therefore conclude by recommending the modern planter not wholly to disregard recommendations so weighty, on a subject so intimately connected with his own advantage.



THE ALMOND.

The Almond is indigenous to Barbary, China, and many of the eastern countries; but at what period it was introduced into Britain is very uncertain.

It is one of the fruits mentioned by the earliest writers:—"Take of the best fruits of the land," says Jacob to his sons, "in your vessels, and carry down the man a present, a little balm, a little honey, spices and myrrh, nuts and almonds." And again we have it noticed in the case of the miraculous rod of Aaron:—"The rod of Aaron of the house of Levi, was budded and brought forth buds, and blossomed blossoms, and yielded almonds." We find it also introduced into the sculpture of the Israelites, who admitted only the fruits and flowers of their country, in the embellishments of their most refined arts. The Almond was selected to beautify the candlesticks for the tabernacle, and in the decorations of the temple of Solomon we find it and the pomegranate, both sculptured in wood and wrought in gold.

Theophrastus, who flourished three hundred years before Christ, remarks of the Almond that it was the only tree in Greece that produced the blossoms before the leaves: and it is probable that it was introduced into Italy from that country, as Cato calls the fruit *nuces Græcæ*, or Greek nuts. From Italy it was brought into Britain, it is conjectured about the time of Henry VIII.; but this may be doubted: for Dr. Turner, who wrote in 1645, nearly a century afterwards, says, "Almond trees growe muche in hygte Germany beside Sypre in a cytie called Newstat, and great plentye in Italye, and some growe in England, but I have hearde of no greate store of the fruyte of them that growe in England."

As a fruit-bearing tree it never can be considered as worthy of much attention from the British fruit cultivator, while its fruit can be purchased much better, and at comparatively a trifling expense, from the importers of foreign fruits.

As an ornamental tree, either for the lawn or shrubbery, its merits are far greater. The beauty of its blossoms, as well as their early appearance, renders it a very general favourite, particularly the variety with double flowers. Where a few trees of the single-flowering varieties are planted as trees of ornament, in good seasons fruit may be expected, at least to the extent of gratifying those who may derive a pleasure from seeing Almonds of their own growth on their tables.

Two sorts only are in cultivation in this country as fruit-bearing trees, the sweet, or Jordan, and the tender-shelled, or Sultane, and these require not only the warmest situations, but also the protection of a south wall to secure a crop, as their blossoms are so early produced, and at the same time so tender, as to suffer from our spring frosts. For although the Almond will produce its fruit in favourable situations as a standard, it is only in those seasons when it is exceedingly mild while they are in bloom and while the fruit is setting, which circumstances but seldom occur in the generality of situations in our variable climate.

The medicinal properties of the Bitter Almond are considerable, but it should be administered by professional persons only, being a powerful poison when taken in too large a dose. The kernels of the Sweet Almond are of considerable use in the arts; the oil obtained from them is used by draughtsmen in tracing drawings on common letter paper. "The oil renders the paper quite transparent: and, after the tracing is taken, it may be completely evaporated by holding the paper a minute or two before a fire."

It may be interesting to some of our fair readers to be informed that Macassar oil is merely oil of Almonds, coloured red with alkanet root; and the no less celebrated Russia oil is the same, rendered milky by a small quantity of ammonia or potash, and scented with oil of roses. Gowland's Lotion, Milk of Roses, Caledonian Cream, Kalydor, &c., are nothing but a solution of oxymuriate of mercury in almond emulsion, with a proportion of sugar of lead, or white oxide of bismuth. Perhaps the inventors of these popular and fashionable cosmetics are indebted to Pliny for the first idea, as he states that a decoction of the roots of the Bitter Almond tree supples the skin, prevents wrinkles, and gives a fresh, cheerful vigour to the countenance. Another very important virtue is ascribed to the fruit of the Bitter Almond, namely, to prevent or relieve intoxication. Plutarch relates that Drusus' physician, who was the greatest Bacchanalian of his age, took at every cup five bitter almonds, to allay the heat and fumes of the wine, owing to which he never became intoxicated.

VARIETIES AND SPECIES.—Miller enumerates three varieties; Forsyth seven; Rogers two; Ency. of Gard. nine; Mr. M. G. Lindley eight; the Nursery Catalogues eight.

SELECT LIST OF ALMONDS.

1. *Tender Shelled. Syn.*, Sultane.—Size of the nut, about an inch in length; form, oval; shell, light-coloured, tender, and porous; kernel, plump, rich, and sweet.
2. *Sweet. Syn.*, Jordan.—Size of the nut, above an inch in length; form, oval; shell, tender; kernel, large, plump, and sweet; leaves, short, broad, and crenated.

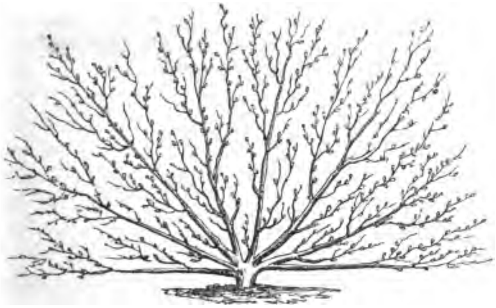
PROPAGATION.—The Almond is propagated by seeds when the object is to obtain new or improved varieties, but in much greater number for stocks on which to bud, not only approved varieties of itself, but also for peaches and nectarines. The Almond wrought on its own stock is of short duration, but if on the Mussel plum it will be much more durable and healthy. Forsyth says that Almonds budded on plum stocks thrive best in wet soil, and on almond or peach stocks in a dry soil. Mr. Thompson, in the Ency. of Gard., on the same subject, thinks that the peach stocks are not to be so much recommended as Almond stocks in this country: for it is probable that peach stocks when worked with the Almond will fail in a few years, in the same way as they do when used as stocks for peaches and nectarines.

PLANTING.—According to Forsyth, if the soil be dry, it should be done in October, when the leaves begin to decay: but if in wet ground, the month of February is the proper season. He further directs that, when the young trees are brought into the nursery, they should never be cut till the young shoots begin to break. The back part of shrubberies or lawns are the proper situations for standard Almonds, although a tree or two may be planted against a south wall for the greater certainty of obtaining fruit. The season, mode, and other particulars as to planting this tree are the same as will be directed for the peach and nectarine, (which see).

Pruning.—Standard Almonds, like other fruit trees so grown, are much neglected in regard to pruning; a regulation of the branches, a thinning out of all diseased and ill-placed ones, as well as a reduction of the number even of healthy ones, must be of great advantage to the tree, not only by admitting the sun's rays better to the centre, and thereby assisting the ripening of the fruit; but also by strengthening the shoots and branches left, and throwing more sustenance into the fruit, which would otherwise be expended in producing useless leaves and branches.

As the Almond produces its fruit like the peach and apricot, chiefly on the young wood of the preceding year's growth, and also upon spurs which are naturally formed upon older branches, it follows that its pruning must be regulated upon the very same principle.—*See* Peach, Nectarine, and Apricot.

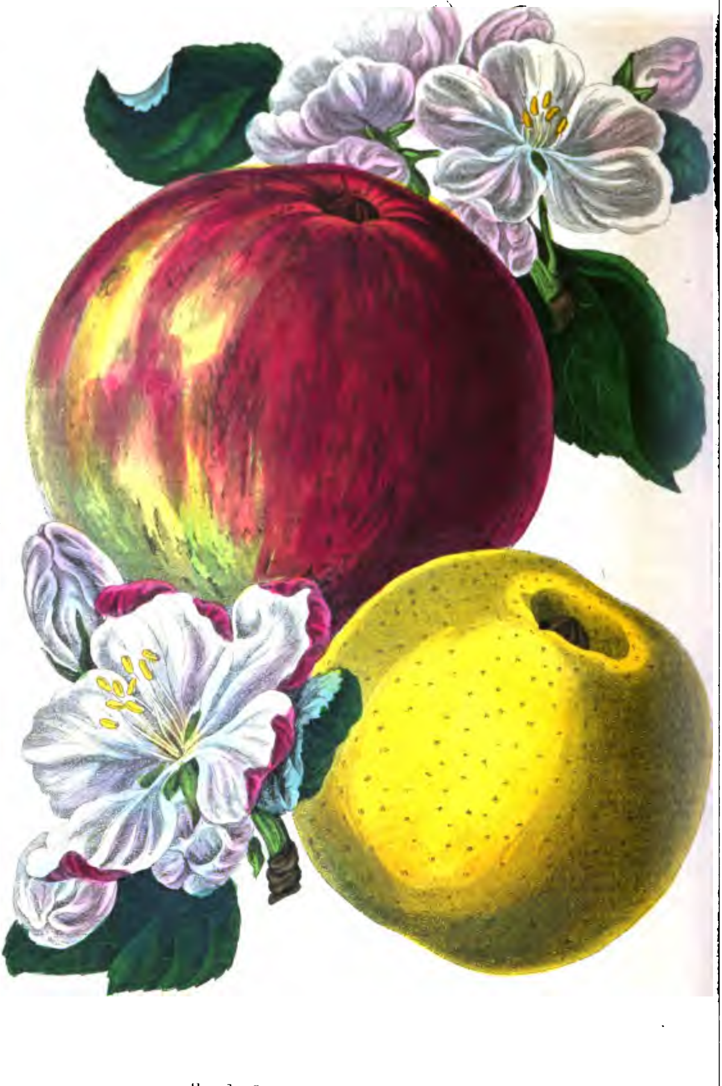
Training.—When trained against walls, the fan principle, (vide annexed sketch), is the most proper, and the same rules hereafter to be laid down for peaches, apricots, &c., must be followed.



Stocks.—The plum and peach stocks are to be preferred: the former is the most desirable, and best suited for the majority of soils.

Destructive Insects.— The aphides will attack the Almond, and must be removed by the same means as are employed in the case of the peach and nectarine.

Gathering and Management of the Fruit.—The fruit should be allowed to remain on the tree until the rind becomes quite brown, any the kernels firm and solid, when it may be gathered, and divested of its outer coat, and then gradually dried until the shell becomes sufficiently hard: it may then be put into paper bags, and kept in a dry airy place for use.



Scarlet Nonpareil. – Golden Pippin.

THE APPLE.

Of all European fruits, the Apple, (the *Pyrus Malus* of Botanists,) is unquestionably the most valuable, and by far the most generally cultivated within those latitudes in which it is found to thrive. At what period, or in what manner, it first became known to the inhabitants of this country, is involved in the obscurity of antiquity; for the wild crab is the only fruit of the kind indigenous to this country, or, indeed, to any other; and from it, at some period, and by some means or other, all our improved varieties have been obtained. The cultivated Apple owes its existence to the art and industry of man, and is not, although asserted by some, the natural production of any soil or climate. It is mere conjecture to suppose that it was not known in Britain prior to the Roman Invasion, but that it was introduced by that people. Tacitus, writing in the year seventy-nine, informs us, that there is great probability for thinking that the soil and climate were very fit for all kinds of fruit trees, except the vine and the olive. Wine was, however, made in Britain in the third century, but no mention is made of the Apple. That the Apple was cultivated by the Romans in Italy, in the days of Pliny, is very certain, as it is recorded by him (*lib.* 15), as being well known; and not only does he allude to twenty-two kinds, but these he divides into eating, or sweet apples (*Melimala*), and culinary, or kitchen apples; and one sort, in particular, he mentions, which was destitute of kernels; but in no part of his writings does he allude to their being known in Britain. It was, probably, not till after the Norman Conquest, that Apples were much known or cultivated in this country, and it is reasonable enough to suppose that they were introduced from the fertile orchards of Normandy as soon after that date as the state of society would admit of the minds of men being directed to more peaceful pursuits than that of war.

The historian Stow informs us that Pippins were introduced by one Mascal, about 1572, contemporary with Tusser, in whose Five Hundred Points of Good Husbandry, "apples of all sorts" are mentioned; and Parkinson, in 1629, distinctly enumerates fifty-seven sorts. Evelyn, in the preface to his Pomona, informs us, that one Harris, a fruiterer to Henry VIII., introduced the fruits of Flanders, and planted them in Kent; no doubt laying the foundation of those orchards for which that county has ever since been so conspicuous. The Herefordshire orchards, if not principally formed, were very much augmented, by the introduction of most of the best cider apples from Normandy and other parts of France, by a Lord Scudamore, who was ambassador at the Court of Paris, in the time of Charles II.

If Haller, however, be correct in estimating the longevity of the Apple, the Herefordshire orchards must have existed from a much earlier period, as that author asserts that there were trees, in his time, that had attained a thousand years, and were still productive. The late Thomas Andrew Knight, Esq., than whom few were more competent of judging, was of opinion that two hundred years are nearer the ordinary duration of the Apple tree, an opinion from which we think few modern vegetable physiologists will venture to dissent.

The Apple we consider, even when grafted on the crab stock, to be a tree of much shorter duration than the pear, which latter, we doubt not, is capable of attaining an age of five hundred years, and even upwards.

Of all the fruits that are produced in our climate, none is brought to so great perfection as the Apple, and with so little trouble, nor amongst them is there any comprising so many varieties, affording, as it were, a choice for every soil, situation, and climate, which our island affords. The Apple is the fruit of the poor as well as the rich; it is capable of being had in perfection throughout the year; it forms an agreeable addition to the food of man, and also supplies him with a beverage as wholesome, as pleasant, and as exhilarating, as any of the wines of which the Rhenish provinces can boast. It is not generally known in this country, that the refuse of the orchard and fruit-room, when past all other use, may be manufactured, by the ordinary processes of fermentation and distillation, into an excellent brandy, and, indeed, a very great portion of the brandy of France is made from this fruit. How far the manufacture of that spirit for home-consumption might affect the interests of international commerce, is no concern of ours: we state the fact, to show, that should political circumstances arise to impede, or prevent, the importation of this spirit from the continent, we have a resource within ourselves which would go far to supply our own consumption. This supply might be very greatly extended, as hundreds of acres in Britain, at present uncultivated, would produce the Apple in great abundance.

The medicinal properties of the Apple are considerable. Verjuice, or the juice of the wild crab, is a valuable astringent and repellent, and has been long used as an application to sprains. The fruit of the cultivated Apple, when ripe, is laxative, and when boiled or roasted it has been found serviceable in cases of indigestion and weakness of the stomach, and also in putrid and malignant fevers. As connected with the arts the bark is used in dyeing a yellow colour, and the wood for turning and other purposes, where hardness and variety of colours are sought for: the pulp mixed with lard forms pomatum, and its uses in confectionary are many and well known.

Very excellent bread has been made of apples in France, which is said to have been the invention of M. Duduit de Mazieres, in the following simple manner:—"After having boiled one-third of peeled apples, he bruised them while quite warm into two-thirds of flour, including the proper quantity of yeast, and kneaded the whole without water, the juice of the fruit being quite sufficient; when this mixture had acquired the consistency of paste, he put it into a vessel, in which he allowed it to rise for about twelve hours. By this process he obtained a very excellent bread, full of eyes, and extremely palatable and light."—*Pomarium Britannicum.*

VARIETIES.—Gerard, in his History of Plants, describes but seven kinds: the Pome water, the Baker-ditch Apple, the King of Apples, the Quining, or Queen of Apples, the Summer Pearmain, the Winter Pearmain, and the Paradise Apple. Of the three first sorts we have now no certain knowledge, but the others still maintain their places as excellent second or third-rate fruits. By his description of Apples it would appear that there were in his day many more varieties than the above, for he says, "The fruit of Apples do differ in greatness, form, colour, and taste; some covered with a red skin, others yellow or green, varying exceedingly, according to the soil and climate; some very great, some little, and many of a middle sort; some are sweet of taste, or something sour; most are of a middle taste, between sweet and sour; the which to distinguish I think it impossible, notwithstanding I hear of one that intended *to write a peculiar volume of Apples*, and the use of them."

Tusser, in 1573, as we have noticed above, mentions Apples of all sorts. Parkinson, in 1629, enumerates fifty-seven sorts. Hartlib, in 1650, alludes to one cultivator who was possessed of two hundred sorts, and he believes that in his time there were not less than five hundred sorts in this island. The celebrated John Ray, in 1688, was informed that there were seventy-eight sorts cultivated in the London nurseries. Miller, Abercrombie, and others, enumerate or describe many kinds, and Forsyth, in 1806, describes one hundred and ninety-six kinds. Mr. G. Lindley, in 1831, very minutely and clearly describes no less than two hundred and fourteen; Mr. Rogers, of Southampton, a selection of approved sorts, to the number of one hundred and forty; while the Fruit Catalogue of the London Horticultural Society presents us with a list of one thousand four hundred kinds, three-fourths of which are either the same fruit under different names, or are unworthy of cultivation.

SELECT LIST OF APPLES.

1. **Acklam's Russet.**—Originated in Yorkshire. Size, below the medium; form, perfectly round in its outline; colour, pale yellowish green, covered with smooth grey russet; stalk, half an inch in length; eye, small, sunk in a regular open basin; flesh, greenish white; flavour, high and poignant; duration, from November till February; habit, small grower, very hardy, and a great bearer; merit, second-rate dessert; should only be planted in dry soils.
2. **Adam's Pearmain.** *Syn.*, Norfolk Pippin.—Size, above the medium; form, pearmain-shaped; colour, pale greenish yellow, thinly covered with grey russet; stalk, slender, three-quarters of an inch in length; eye, rather small, placed in a very narrow basin; flesh, yellow, firm, and crisp; flavour, highly aromatic; duration, from November till February; habit, very hardy, promising to be an excellent orchard tree, and suitable for the market-gardener; merit, second-rate dessert; should be grafted on the Doucin stock.
3. **Æsopus Spitzemberg.**—Originated at Æsopus, in Ulster County, America. Size, above the medium; form, oblong; colour, brilliant red, with many small yellow spots; stalk of moderate length; eye, medium size; flesh, yellow; flavour, rich; duration, from November till February; habit, too tender to be cultivated in England otherwise than as a well-trained tree; merit, when properly ripened, first-rate dessert.
4. **Alexander.** *Syn.*, Emperor Alexander, Aporta.—Originated in Russia. Size, very large; form, somewhat heart-shaped; colour, greenish yellow, slightly

streaked with red; stalk, about three-fourths of an inch in length; eye, large, and deeply seated; flesh, yellowish white; flavour, rich and aromatic; duration, from October till January; habit, strong in wood, shy bearer; merit, second-rate dessert. It prefers a light, rich, loamy soil, and is less liable to be attacked by the American blight than most other trees.

5. Alfreston.—Originated, it is supposed, in Sussex. Size, large; form, oblong, broadly and irregularly ribbed on its sides; colour, pale green, where shaded, yellowish orange next the sun, slightly russet; stalk, short; eye, open, rather deeply sunk; flesh, yellowish white; flavour, sugary, combined with a brisk acid; duration, from October to January; habit, hardy, and a good bearer; merit, a culinary fruit of the first order.

6. Autumn Red Colville.—An old inhabitant of our gardens. Size, medium; form, angular: colour, nearly red, deeper red next the sun; stalk, short; eye, rather open; flesh, yellowish; flavour, pleasant; duration in November and December; habit, healthy, and a liberal bearer. A kitchen fruit of the second class.

7. Autumn Golden Pippin.—Originated in France. Size, small; form, very similar to the Downton pippin; colour, fine blush next the sun, deep yellow when ripe; stalk, short; eye, large and prominent; flesh, yellowish; flavour, rich and agreeable; duration, in September and October; habit, strong and upright, well calculated for training as a dwarf standard or espalier. A table fruit of the second class.

8. Autumn Reinette.—Size, medium; form, ovalish; colour, mottled red next the sun, yellowish in the shade; stalk, medium length; eye, open; flesh, whitish; flavour, rich; duration from October till February; habit, healthy, and an excellent bearer, very suitable for dwarf training. A second-rate table apple.

9. Aromatic Russet.—Size, medium; form, rather conical, but flattened at both ends; colour, green, covered with a light shade of russet; stalk, very short; eye, small; flesh, greenish white; flavour, sugary and perfumed; duration, from November till February; habit, very hardy, and excellent bearer, wood rather slender, producing numerous spurs; wood and leaves of a whitish hue; merit, third-rate dessert. Like all other russets, it requires a dry situation and loamy soil.

10. Barcelona Pearmain. *Syn.*, Reinette rouge, Reinette rousse, Reinette des Carmes, Speckled golden Reinette, Glace rouge, Polinia, Pearmain of the Kentish orchards.—Originated in France; hence the above names. Size, medium; form, oval; colour, brownish yellow where shaded, deep red on the sunny side; stalk, short; eye, small and shallow; flesh, yellowish; flavour, rich aromatic; duration, from November till February, and sometimes keeps till April; habit, slender-branched, a good bearer; merit, a second-rate dessert fruit.

11. Belle-bonne.—Originated in all probability in France, but has been upwards of a century in our gardens, although, nevertheless, but little known. Size, large; form, oblong; colour, dark green, striped with red next the sun; stalk, short; duration from October till January; habit, healthy, and a good bearer, deserving to be more generally cultivated.

12. Blenheim Pippin. *Syn.*, Blenheim orange, Woodstock pippin.—Originated from seeds in the garden of a baker at Old Woodstock. Size, large; form,

roundish, rather broadest at the base; colour, yellowish, stained with red on the sunny side; stalk, medium length; eye, open and very hollow; flesh, yellow; flavour, extremely pleasant; duration, from November till March; habit, healthy and vigorous, and hence does not produce fruit while young, but is afterwards a great bearer; merits, one of the best of our large table fruit.

13. Borsdorf. [*Syn.*, Potdoff, Bursdoff, Queen's Apple, Queen Charlotte's Apple, Reinette batarde, Postophe d'Hiver, Borsdorffer.]—Originated in Germany, and introduced into this country about 1761. Size, below the medium; form, roundish, rather narrower at the crown than at the base; colour, pale yellow; covered with grey russet, red where fully exposed to the sun; stalk, slender, half an inch in length; eye, small; flesh, yellowish white; flavour, sugary and perfumed; duration, from November till February; habit, rather diminutive, though healthy; its early and productive habits prevent it from attaining a large size; merits, a dessert fruit, of the first class.

14. Bringewood Pippin.—Originated by Mr. Knight, from a seed of the Golden Harvey, impregnated with the pollen of the old Golden Pippin. Size, small; form, nearly round; colour, deep yellow when ripe; stalk, short and slender; eye, small; flesh, yellowish; flavour, agreeably aromatic; duration, from December till March; habit, generally healthy, rather a tender grower, not a very abundant bearer, but yet a desirable table apple.

15. Breedon's Pippin.—Size, small; form, similar to the old Golden Pippin; colour, light yellow tinged with red, particularly where exposed to the sun; stalk, short and slender; eye, open; flavour, excellent; duration, November and December; habit, slender, requiring a dry soil; in all respects resembling the old Golden Pippin.

16. Braddick's Nonpareil.—Originated with the late Mr. Braddick. Size, small; form, quite the Nonpareil shape; colour, green and russet, tinged with red next the sun; stalk, short and stout; eye, open; flesh, yellowish; flavour, rich and pleasant; duration, from November till February; habit, moderate in growth, an excellent bearer, and calculated for dwarf training.

17. Canadian Reinette.—[*Syn.*, Portugal apple, Reinette d'Angleterre, Reinette de Caen, Reinette de Canada blanche, Reinette de Canada à Cotés, Reinette grosse de Canada.]—Originated in Canada, but now distributed throughout almost all Europe. Size, large; form, broad and flat, but varies much in this respect; colour, greenish yellow, tinged with brown on the sunny side; stalk, short; eye, rather open; flesh, yellowish white; flavour, pleasant, sub-acid; duration, from December till March; habit, healthy, and a moderate bearer; merit, a dessert fruit of the first class.

18. Cat's Head.—Size, very large; form, irregular, flattened at both ends; colour, light green; stalk, medium length; duration, in October and November; habit, healthy; moderate bearer while young, afterwards very fruitful; one of our best kitchen fruits.

19. Caroline Apple.—Originated in the garden of the late Lord Suffield, in Norfolk, and named after Lady Suffield. Size, above medium; form, nearly round; colour, rich yellow, streaked with red; stalk, very short; eye, small; flesh, firm and juicy; flavour, excellent; duration, from November till February; habit, healthy; moderate bearer; merit, first-rate culinary fruit.

20. Calville d'Eté. [*Syn.*, Summer Calville.]—Originated in France, and introduced above fifty years ago, by Sir P. Stevens. Size, medium: form, oval,

much ribbed, like all the other Calvilles: colour, light yellow, tinged with red next the sun: flavour, pleasant, although tartish; duration, August: habit, slender, well adapted for dwarf training: one of the best very early apples, as well as an abundant bearer.

21. Claygate Pearmain.—Originated in a hedge-row at Claygate, near Claremont and brought before the notice of the Hort. Soc. by the late J. Braddick, Esq., in 1821.—Size, large: form, Pearmain-shaped: colour, dull yellow, with many broad stripes of deep red: stalk, medium length: eye, rather large: flesh, yellow, as in all apples of this class: flavour, sugary and perfumed: duration, from November till February: habit, healthy, vigorous, and an excellent bearer: merit, a first-rate large dessert fruit.

22. Chester Pearmain.—Originated, it is supposed, at or near Chester. Size, small: form, Pearmain-shaped: colour, dull green, marbled with red, becoming deep yellow when ripe: eye, very small: flavour, good: duration, during November, December, and January: habit, healthy: and when wrought on the Paradise stock, suitable for dwarf training.

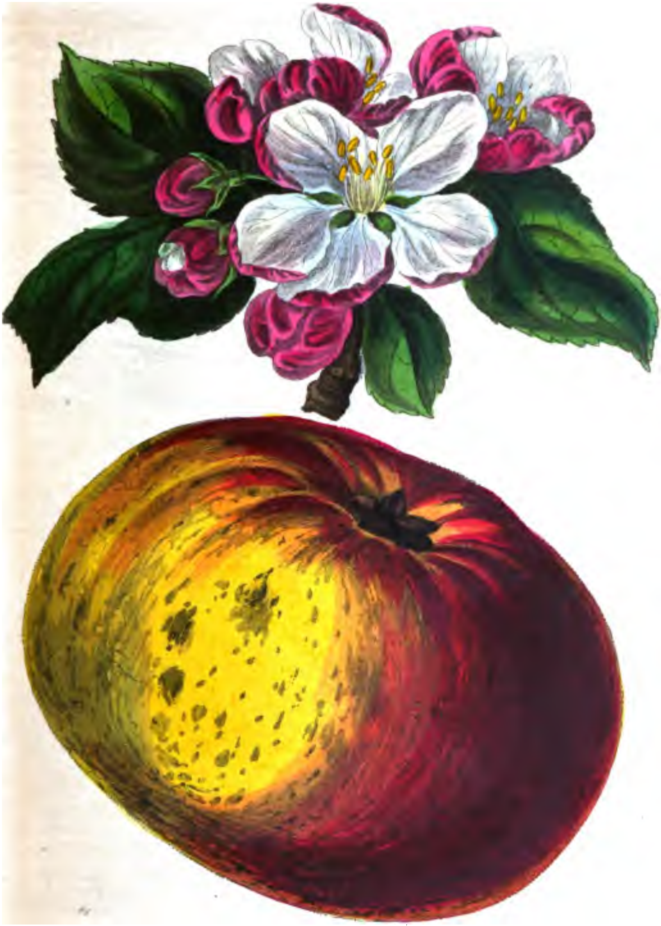
23. Christie's Pippin.—Size, medium: form, round and flat: colour, dull yellow, marbled with red next the sun: eye, small; stalk, short: flavour, rich, and fit for the dessert: duration, in November and December: habit, hardy, and of moderate growth.

24. Cobham Apple.—Originated, we suppose, near or at Cobham Hall, in Kent. Size, above the medium: form, rather irregular: colour, yellowish green, with slight dashes of red on the sunny side: stalk, slender, half-an-inch in length: eye, small, nearly closed: flesh, pale yellow: flavour, sugary and aromatic: duration, from September to January: habit, strong, healthy, vigorous tree, moderate bearer: merit, a third-rate table fruit.

25. Cockle Pippin. [*Syn.*, White cockle, Nutmeg cockle pippin, Nutmeg pippin.]—Originated, it is conjectured, in Sussex, where it is much cultivated for the London market. Size, medium: form, oblong, tapering a little towards the crown: colour, pale green at first, becoming bright yellow, partially covered towards the base with thin russet: stalk, slender, half-an-inch in length: eye, narrow, rather shallow: flesh, yellowish: flavour, sugary, with a pleasant perfume: duration, from November till May: habit, rather diminutive in growth, but hardy: an excellent bearer: merit, a dessert fruit of the second class in regard to flavour, but of first-rate merit on account of keeping so long.

26. Cornish Aromatic.—Originated, it is conjectured, in Cornwall, from whence it was introduced to the notice of the Hort. Soc. by Sir C. Hawkins. Size, large: form, roundish and angular: colour, brownish russet on the shaded side, with bright red dots on the side next to the sun: stalk, short: eye, small and sunken: flesh, yellowish: flavour, aromatic and rich: duration, from November till February: habit, healthy and good bearer: merit, an excellent table or kitchen fruit, not so generally cultivated as it deserves.

27. Cornish Gilliflower. [*Syn.*, Calville d'Angleterre, Cornish July Flower, July Flower.]—Originated in a garden near Truro, about the beginning of the present century. Size, above medium: form, oval and angular: colour, dull green where shaded, reddish and russet next the sun: stalk, nearly an inch in length: eye, nearly closed by the segments of the calyx: flesh, yellowish: flavour, very rich, and when cut, giving out a perfume resembling the clove carnation, whence its name: duration, from November till April: habit, healthy and vigorous, but



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form, round, flattened at both ends; colour, yellow, with a slight tinge of red next the sun; stalk, very short; eye, large and open; flesh, yellow; flavour, brisk and agreeable; duration, from November till April; habit, healthy, and a good bearer; merit, a first-rate kitchen fruit.

35. Dutch Codlin. [*Syn.*, Glory of the West, Royal Codlin.]—Size, one of the very largest; form, irregularly globular, having several prominent angles; colour, light green, slightly tinged with red on the side next the sun; stalk, short and thick, and firmly attaching the fruit to the tree, a great merit in so large a fruit; duration, August and September; habit, while young, rather a shy bearer, not so afterwards, a strong grower, and very seldom attacked with the American blight. One of our best kitchen fruits.

36. Early Crofton. [*Syn.*, Irish Peach Apple.]—Originated in Ireland. Size, medium; form, roundish; colour, greenish brown in the shade, reddish towards the sun; stalk, medium length; eye, medium; flesh, greenish white; flavour, excellent; duration, August and September; habit, bears at the extremities of the branches, very productive; merit, a good autumn table fruit.

37. Easter Pippin. [*Syn.*, French Crab, Deux Ans, Claremont Pippin, Young's Long-keeping, Ironstone Pippin.]—Originated evidently on the Continent; but when or how introduced is unknown. Size, medium, unless when the trees are over-loaded, when the fruit is of course under the medium size; form, nearly round; colour, quite green, unless where very much exposed to the sun, when it is tinged with a shade of brown, turning yellowish when ripe by sufficient keeping; stalk, slender and short; eye, small, almost closed; flesh, pale green; flavour, middling; duration, from November till August, and often lasts, if well kept, till the November following, and in some cases it has been preserved for two years—hence the name Deux Ans; habit, healthy, and an extraordinary great bearer; merit, one of the most valuable kitchen fruits in cultivation.

38. Early Julian.—Originated in Scotland, and only recently introduced into the southern collections. Size, medium; colour, perfectly yellow, seldom tinged with red; flavour, rich and agreeable; duration, the end of August, and beginning of September; habit, a good bearer, and as an early summer fruit deserving of cultivation, from its slender habit of growth well calculated for dwarf training.

39. English Codlin.—Originated in all probability in England, but at what period is not now known. Size, above medium; form, irregular and much ribbed; colour, light green, tinged with red; flesh, very white, and full of juice; duration, from June to September; habit, in any soil except clay and gravel it attains a full size, and produces abundantly. Large branches planted in the ground in a moist soil will root and make healthy trees. This once esteemed apple is now seldom met with, it place being taken by the Hawthornden and Keswick codlin; very subject to the attacks of the American blight.

40. Fameuse Pomme de Neige. [*Syn.*, Snow Apple.]—Introduced about forty years ago from America. Size, medium; form, regular; colour, light green, slightly tinged with red; flesh, whiter than any other apple, hence the name; flavour, pleasant, with abundance of juice; duration, October and November; habit, too delicate for an orchard tree, but well suited for dwarf training, requiring a dry and light soil: in other soils it is liable to canker.

✓ 41. Fearn's Pippin.—Size, medium; form, round and flattened; colour, greenish yellow where shaded, and deep red where more fully exposed; stalk, short; eye, large and shallow; flesh, whitish; flavour, rich and pleasant; duration, from November till March; habit, very hardy, and an abundant bearer; merit, first-rate dessert fruit. One of our most valuable apples, and should be planted in every garden, however small.

42. Forman's Crew.—Originated by T. S. Forman, Esq., in Glamorganshire. Size, below the medium; form, rather conical; colour, yellowish russet brown; stalk, short; eye, small; flesh, greenish yellow; flavour, excellent; duration, from November till May; habit, healthy, and an abundant bearer; merit, one of our very best dessert fruits.

43. Flower of Kent.—Originated near Sandwich, in Kent, many years ago. Size, large; form, irregular and flattish; colour, fine red next the sun, partially streaked with reddish tints on the shaded side; flesh, yellowish; flavour, good, and abounding in juice; duration, October and November; habit, healthy, and a good bearer, better adapted for a standard than for dwarf training, on account of the luxuriance of its growth.

44. Franklin's Golden Pippin. [*Syn.*, Ludlow's Fall Pippin.]—Originated, it is supposed, in America, from whence they were, according to Lindley, introduced into this country by Mr. Ludlow, in 1819, but he at the same time remarks that they had been previously introduced as early as 1805 or 1806. We, however, suspect that they were known in this country long before, as two trees of this sort exist in the Claremont gardens that must have been planted at a much earlier period. Size, rather below the medium; form, oval, but broadest at the base; colour, deep yellow, sprinkled with many grey or dark-coloured spots; stalk, slender and short; eye, shallow, nearly closed by the segments of the calyx; flesh, pale yellow; flavour, rich and aromatic; duration, from September till February; habit, wood slender, healthy, and a great bearer; merit, one of our best dessert fruits.

45. Fulwood.—Originated at Fulwood, near Sheffield. Size, large; form very irregular; colour, greenish, freckled with red spots on the shaded side, marked with dark reddish stripes on the side most exposed to the sun; stalk, slender and short; eye, large, nearly closed; flesh, pale green; flavour, sugary and perfumed; duration, from November till March; habit, healthy, and a good bearer; merit, an excellent culinary fruit.

46. Golden Harvey. [*Syn.*, Brandy Apple.]—Originated, it is conjectured, in Glocestershire or Herefordshire, in both of which counties it has been known from time immemorial. Size, small; form, nearly globular; colour, dull russet, with a yellow ground, often reddish next the sun; stalk, slender, half an inch in length; eye, small and open; flesh, yellow; flavour, very rich; duration, from December till June; habit, slender, but healthy, and a great bearer; merit, one of our very best dessert fruits.

47. Golden Reinette. [*Syn.*, English Pippin, Wyker Pippin, Aurore, Yellow German Reinette.]—Size, below the medium; form, nearly round; colour, greenish yellow in the shade, golden yellow streaked with red next the sun; stalk, strong, and about an inch in length; eye, large and open; flesh, yellow; flavour, rich and saccharine; duration, from October till February; habit, healthy, and a good bearer; merit, a beautiful and first-rate dessert fruit. One of the most common apples in the London market, and deserving of general cultivation.

48. Golden Pearmain. [*Syn.*, Ruckman's Pearmain.]—Size, below the medium; form, conical, but slightly angular at the sides; colour, bright yellow, intermixed with red and orange, the latter colour predominating the more the fruit is exposed to the sun; stalk, slender, about half an inch in length; eye, small; flesh, yellow; flavour, agreeably aromatic: duration, from October till January; habit, healthy, and a good bearer; merit, a first-rate dessert fruit.

49. Golden Knob.—Introduced from France by Sir P. Stephens. Size, below the medium; form, globular; colour, dark yellow, russet next the sun; flavour, very pleasant; duration, from December till the end of February; habit, healthy, and one of the most abundant bearers, and thriving better on light, poor soils than in those that are more fertile. An apple which should be found in every garden, particularly in those of the market-gardener and cottager.

50. Golden Nonpareil.—Size, less than the old Nonpareil; form, that of the Nonpareil group; colour, deep yellow when ripe, which distinguishes it from the rest of the family; flavour, very agreeable; duration, from December till February; habit, like all the rest of this family, slender growers, and well calculated for dwarf training, particularly when wrought on Paradise stocks.

51. Golden Pippin. [*Syn.*, Pepin d'or, Old, or English Golden Pippin.]—Originated, it is conjectured, by Rogers, of Southampton—no mean authority in matters connected with Pomology—at Parham Park, on the South Downs of Sussex. Size, small; form, somewhat conical; colour, yellow, changing to deep gold when fully ripened; stalk, long and slender; eye, small, and rather prominent; flesh, yellowish; flavour, rich and agreeable; duration, from October to January; habit, slender, requiring a dry soil and warm climate to bring the fruit to perfection, or to insure the health of the tree; merit, one of our very best dessert fruits. This is one of our oldest apples; it is mentioned by Worlidge, who says, "It is smaller than the Orange apple, else much like it in colour, taste, and long-keeping." Evelyn also mentions it in his Diary, 22nd of October, 1685, that at Lord Clarendon's seat, at Swallowfield, Berks, there is an orchard of one thousand golden pippins and other cider pippins. The Golden Pippin is cultivated to a very considerable extent on the mountains in Madeira, even at an altitude of three thousand feet above the sea, where it produces abundant crops, as well as in America, from whence great numbers are annually imported into this country.

52. Golden Russet.—Size, below the medium; form, nearly round; colour, copper-coloured, yellowish russet; stalk, very short; eye, rather small and close; flesh, pale yellow; flavour, pleasantly aromatic; duration, from December till April; habit, hardy, bearing well in bleak situations, and remarkable for the pendulous and slender disposition of its branches; merit, a dessert fruit of the second order.

53. Gravenstein. Originated at Gravenstein, in Holstein, Germany, and, with the Courtpendu Plat, is the best apple the Continent can boast of. Size, large; form, somewhat oblong, with angles terminating in the crown; colour, yellowish green, marked with red on the side next the sun; stalk, very short; eye, wide, sunk in a deep basin; flesh, pale yellow; flavour, very high and vinous; duration, from November till April; habit, extremely healthy, rather a shy bearer; merit, one of our first-rate dessert fruits.

54. Green Newtown Pippin.—Originated in America. Size, medium; form, roundish, tapering a little towards the crown; colour, dark green; stalk,

slender, about an inch in length; eye, small and nearly closed; flesh, greenish white; flavour, rich, and slightly aromatic; duration, from December till June; habit, slender, moderate bearer; merit, a second-rate dessert fruit.

55. Harvey Apple. [*Syn.*, Dr. Harvey's Apple.]—Originated in Norfolk so long ago as to be known in the time of Ray, in 1688. Size, above the medium; form, tapering towards the crown, slightly angular; colour, greenish yellow, with many russety fleaks near the crown; stalk, slender, about half an inch in length; eye, small; flesh, whitish; flavour, somewhat acid, and slightly perfumed; duration, from October till January; habit, very hardy, and a great bearer; merit, one of our most valuable kitchen fruits.

56. Hawthornden. [*Syn.*, White Apple, or White Hawthornden.]—Originated at Hawthornden, near Edinburgh. Size, above the medium; form, broadest at the base, slightly tapering towards the crown; colour, white, or very pale greenish yellow, often beautifully tinged with carmine on the side next the sun; this latter circumstance has led some to suppose that there were two varieties of this excellent apple; stalk, slender, about half an inch in length; eye, rather small; flesh, white; flavour, excellent; duration, from September till January; habit, healthy, but not luxuriant in growth, an extraordinary great and certain bearer, coming into fruit the second year from the graft; merit, one of the best of all our kitchen fruits; should be planted in every garden, however small.

57. Hall Door.—Size, medium; form, irregular, but much longer than it is broad; colour, dull yellow, streaked with red; stalk, short and thick; eye, hollow; flavour, good; flesh, white, firm, and moderately juicy; duration, from November till March; habit, healthy, branches growing erect, and altogether one of our best orchard fruits.

58. Holland Pippin.—Originated in Holland, but introduced into the Kentish orchards before the time of Miller or Langley, both of whom recommend this fruit. Size, large; form, roundish; colour, greenish yellow, turning very yellow when ripe, as well as russet, slightly tinged with red; flesh, very firm; flavour, pleasantly acid; duration, from November till March; habit, healthy and productive, but requiring a loamy soil on a dry bottom.

59. Hoary Morning. [*Syn.*, Dainty Apple.]—Originated in Somersetshire. Size, above the medium; form, round, slightly angular; colour, polished in the shade, irregularly striped with red next the sun, and covered with a hoary bloom; stalk, short; eye, very small; flesh, yellowish white; flavour, rich and agreeable; duration, from September till January; habit, healthy, and a good bearer; merit, one of our best and most handsome kitchen fruits.

60. Hughes's Golden Pippin. [*Syn.*, Hughes's New Golden Pippin.]—Size, below the medium; form, round, slightly flattened at both ends; colour, yellow, with many green spots, and a slight russet covering; stalk, short and thick; eye, large and open; flesh, yellowish; flavour, rich and agreeable; duration, from October till January; habit, slender, but a healthy and excellent bearer; merit, a first-rate dessert fruit.

61. Irish Peach Apple. [*Syn.*, Early Crofton.]—Originated in Ireland. Size, medium; form, nearly round; colour, yellowish green on the shaded side, brownish red, streaked with red towards the sun; stalk, short; eye, nearly closed by the segments of the calyx; flesh, white; flavour, rich and agreeable; duration, August, as it ripens on the tree; habit, healthy, and an abundant bearer; merit, one of our very best early table apples.

✓ 62. Kerry Pippin.—Originated, it is conjectured, in the county of Kerry, where it is much cultivated. Size, medium; form, oval, flattened at the eye; colour, pale yellow, marbled with red, highly polished; stalk, short; eye, small; flesh, yellow; flavour, exceedingly high; duration, from September till January; habit, rather broom-headed, young wood upright and full of spurs, a moderate bearer; it is one of our best table sorts.

63. Kentish Codlin. [*Syn.*, Fill Basket.]—Size, very large; form, irregularly longish; colour, yellowish green where shaded, slightly tinged with blush next the sun; duration, in September; habit, healthy and lofty-growing tree, and one of the most profitable kitchen apples that can be planted.

64. Kentish Pippin.—Size, large; form, longish, of an uneven surface; colour, yellow when ripe, with many brown spots; eye, small; stalk, long and slender; duration, from November to February; habit, healthy and productive, requiring a loamy soil on a dry bottom.

65. Keswick Codlin.—Originated at Keswick, in Cumberland. Size, above the medium; form, somewhat irregularly five-sided; colour, pale yellow, slightly tinged with blush on the side next the sun; stalk, short; eye, large and deep; flesh, pale yellow; flavour, slightly subacid; duration, from September till November; habit, upright, healthy, small-growing tree, perhaps the most abundant and certain bearer of all apples; a first-rate culinary fruit.

66. King of the Pippins. [*Syn.*, Hampshire Yellow, Jones's Southampton Pippin.]—Size, above the medium; form, nearly oblong; colour, pale orange yellow, tinged with red towards the sun; stalk, slender, about an inch long; eye, large and deep; flesh, yellowish white; flavour, excellent; duration, from the beginning of November till the end of December; habit, hardy, and an abundant bearer; it is one of our best dessert sorts.

✓ 67. Kirk's Golden Pippin.—Originated from a seed of the old Golden Pippin, by Mr. Joseph Kirk, a well-known and respectable fruit-tree cultivator, at Old Brompton. Size, small; form, similar to that of the Golden Pippin; colour, pure yellow when fully ripe, or where most exposed to the sun, greenish yellow where more shaded; stalk, rather short; eye, large; flesh, pale greenish yellow; flavour, exceedingly high; duration, from September till January; habit, "like all other Golden Pippins, too tender for an orchard tree in cold situations. It succeeds best when grafted upon the Doucin stock," and planted in a warm garden, or on a wall in cold climates; one of our very best table fruits.

68. Kirk's Scarlet Admirable.—Originated, or perhaps rather first brought into notice, by Mr. Joseph Kirk, of Brompton. Size, large; form, slightly conical; colour, red next the sun, greenish yellow where shaded; duration, from October to the end of December; habit, healthy, but not a first-rate bearer.

69. Kirk's Incomparable.—Size, large; form, longer than round; colour, at first pale green, turning yellow when ripe, red next the sun; duration, from November till January; habit, healthy and productive, but very subject to the American blight; it is an excellent kitchen apple.

70. Kirk's Lord Nelson.—Originated on the Continent, and introduced to this country by Mr. Kirk, without a name. We have examined several foreign works on Pomology, but have been unable to discover any description or figure of it. Size, above the medium; form, broad at the base, and becoming narrower near the eye; colour, pale greenish yellow where shaded, bright red next the sun; stalk, slender and short; eye, open, rather large; flesh, yellowish white; flavour,

pleasant and aromatic; duration, from November till January; habit, healthy and vigorous, rather a shy bearer; a second-rate dessert fruit.

71. Laneb Abbey Pearmain.—Originated from a seed of the Newton Pippin, at Laneb Abbey, in Kent, in 1803. Size, medium; form, oval, slightly flattened at the ends; colour, yellowish green where shaded, beautifully red, with dark dots, on the side next the sun; stalk, short; eye, small, deeply sunk; flesh, yellow next the skin, greenish towards the centre; flavour, exceedingly sweet and aromatic; duration, from December till March; habit, healthy, and an abundant bearer; it is one of our best table fruits.

72. London Pippin. [*Syn.*, Five-crowned Pippin.]—Originated in Norfolk, where it is very generally cultivated. Size, medium; form, somewhat five-sided; colour, pale yellowish green, changing to lemon as it ripens; stalk, slender and short; eye, small and shallow; flesh, yellowish white; flavour, sub-acid and agreeable; duration, from October till January; habit, slender grower, but an abundant bearer, and one of our best kitchen apples.

73. Loan's Pearmain.—Originated most likely in England, as it is one of the oldest inhabitants of our gardens. Size, above medium; form, similar to other Pearmains; colour, dark green, slightly red on the exposed side; duration, from January to April; habit, healthy, a vigorous grower, and an abundant bearer; an excellent kitchen fruit.

74. Lucombe's Seedling.—Originated by Mr. Lucombe, of Exeter. Size, considerably above the medium; form, roundish, slightly angular; colour, yellowish green, much speckled with dark dots, slightly reddish on the side next the sun; stalk, short and thick; eye, small; flesh, whitish; flavour, agreeable, but not high; duration, from October till March; habit, hardy, and a good bearer; it is an excellent kitchen apple.

75. Manks Codlin. [*Syn.*, Frith Pitcher, Irish Pitcher.]—Originated, we are informed, by Mr. Kewley, in a garden in the Isle of Man. Size, medium; form, slightly oblong; colour, pale yellow, with many dark streaks; stalk, short and fleshy; eye, shallow; flesh, yellowish white; flavour, slightly aromatic; duration, from September till November; habit, healthy, and an abundant bearer; one of our best kitchen apples.

76. Margil.—Originated without doubt in England, as it is not recognized in the Continental Catalogues. Size, small; form, oval; colour, bright orange, mottled with red and brown; stalk, short; eye, small; flesh, yellow; flavour, highly aromatic; duration, from November till March; habit, hardy, and an abundant bearer; it is an excellent table fruit.

77. Martin Nonpareil.—Originated at Martin Hussingtree, near Worcester, about 1795. Size, large for a Nonpareil; form, nearly conical; colour, pale yellow, shaded with brown russet; stalk, short and thick; eye, large; flesh, yellow; flavour, exceedingly rich; duration, from December till May; habit, hardy, and an extraordinary bearer, deserving extensive cultivation; it is one of our best dessert fruits.

78. Master's Seedling.—Originated with Mr. Master, a nurseryman, at Canterbury, and one of the most scientific men in the profession. Size, above the medium; form, nearly globular; colour, yellow when ripe, tinged with red next the sun; flavour, very agreeable; duration, from November till February; habit, hardy, robust, and not subject to the American blight, as well as an abundant bearer.

79. Margaret Apple of Langley. [*Syn.*, Early Red Margaret, Red Juneating, Early

Striped Juneating, Eve Apple of the Irish gardens, but not the Margaret of Miller or Magdalene of Ray.]—Its origin is very uncertain, as we find it as well known in Germany as in England. Size, below medium; form, roundish oblong; colour, greenish yellow, streaked with deep red; stalk, short and thick; eye, small; flesh, white; flavour, rich and agreeable; duration, from the beginning to the middle of August; habit, a slender grower, an abundant bearer, and calculated for dwarf trainings; one tree is enough in a large garden, as the fruit soon grows mealy.

80. Minchall Crab.—Originated at a village of that name in Cheshire. Size, above medium; form, round, somewhat flat; colour, brownish green, slightly red on the side exposed to the sun; eye, prominent; stalk, long and slender; duration, from November to March; habit, hardy, and resists insects, a good bearer, and an excellent kitchen fruit.

81. Newtown Pippin. [*Syn.*, American Newtown Pippin.]—Originated in America, whence immense quantities are annually exported to this country. Size, medium; form, rather irregular in outline; colour, dull green, changing to a yellowish hue as it ripens; stalk, slender and short; eye, open and deeply sunk; flesh, pale yellow; flavour, of the highest order; duration, from December till April; habit, too delicate to be successfully cultivated here otherwise than as a wall tree; when fully ripened, it is a first-rate table fruit.

82. Newtown Spitzemberg. [*Syn.*, Matchless.]—Introduced from America. Size, medium; form, nearly globular, but slightly depressed; colour, pale yellow, slightly reddish next the sun; eye, open; stalk, short and thick; flesh, yellowish; duration, from November till February; habit, moderate grower, abundant bearer, and well worth cultivation for the dessert.

83. New Rock Pippin.—Originated at Barnwell, near Cambridge. Size, below medium; form, Nonpareil shape; colour, green where shaded, brownish, tinged with red, on the side next the sun; stalk, short; flesh, yellow; duration, from November till April; habit, slender in growth, a good bearer, and an excellent dessert fruit.

84. New York Pippin.—Introduced about 1796, from America, we believe, by Mr. Mackie, of Norwich. Size, above the medium; form, between oblong and pyramidal; colour, greenish yellow where shaded, tinged with brown on the side next the sun; eye small; stalk, short and slender; duration, from November till April; habit, strong grower, and an abundant bearer; it is a dessert fruit of great excellence.

85. Norfolk Beaufin. [*Syn.*, Norfolk Beefin.]—Originated, it is conjectured, in Norfolk, but at what period there are no certain records. Size, above the medium; form, round and flattened at both ends; colour, deep green on the shaded side, deep red on the side next the sun; stalk, short and stout; eye, large and deeply sunk; flesh, greenish white; flavour, sub-acid; duration, from November till June; habit, tender, and apt to canker in a cold, damp soil, a great bearer when in a proper soil and situation; they succeed admirably at Claremont in a poor, sandy soil, on a gravelly bottom; it is one of our best kitchen apples.

86. Norfolk Paradise.—Originated in Norfolk, as the name indicates. Size, medium; form, irregularly oblong; colour, greenish yellow where shaded, and brownish red next the sun; eye, very large; stalk, short; flesh, white; duration, from October till March; habit, healthy, a good bearer, and resisting the American blight; a dessert fruit of great merit.

87. Norfolk Colman. [*Syn.*, Winter Colman, Norfolk Storing.]—Originated also in some part of Norfolk. Size, large; form, nearly round, rather flattened; colour, pale yellow where shaded, bright red next the sun; eye, small; stalk, short and thick; duration, from November till March; habit, luxuriantly strong while young, should be grafted on the Paradise stock to correct that habit, very hardy, a good bearer, and a kitchen fruit of great merit.

88. Northern Greening.—Originated, it is conjectured, in Norfolk, but at what period is unknown. Size, above the medium; form, oblong; colour, dull green, brownish on the side next the sun; stalk, short and thick; eye, small; flesh, greenish white; flavour, sub-acid; duration, from November till April; habit, healthy, a tolerable bearer, and a first-rate kitchen fruit.

89. Nonsuch. [*Syn.*, Langton Nonsuch.]—An old inhabitant of our gardens, but probably not the Nonsuch of Ray, who places his Nonsuch among his winter apples. Size, medium; form, nearly globular; colour, pale yellow, or green in the shade, marbled with orange and red next the sun; flesh, very white and tender; stalk, short and slender; eye, small; duration, September and October; habit, slender, and well calculated for espalier or dwarf training, leaves covered with a whitish dust; an excellent bearer, and good for kitchen or table use.

90. Old Nonpareil. [*Syn.*, Nonpareille, Nonpareil, Reinette Nonpareille.] Originated, it is conjectured, in France, but appears to have been introduced to this country above two hundred years ago. Size, rather under the medium; form, flattish; colour, greenish yellow, changing to light russet; stalk, long and slender; eye, small and prominent; flesh, greenish white; flavour, exceedingly rich and pleasant; duration, from December till April; habit, slender, but an abundant bearer, and a first-rate dessert fruit.

91. Old Royal Russet.—Originated, it is probable, in England, but at a very remote period. Size, above the medium; form, rather irregular in outline; colour, rough greyish russet, reddish brown slightly appearing on the sunny side; stalk, short and thick; eye, small; flesh, greenish white; flavour, when fully ripened by keeping, pretty good; duration, from November till May; habit, very hardy, a strong grower, and abundant bearer; it is one of our very best kitchen apples. Mr. George Lindley, in describing this fruit, observes, "The Leather-coat Russet of some country orchards is very different from this, very inferior, and making a very ugly tree, mostly full of disease, and not worth cultivating."

92. Ord's Apple. [*Syn.*, Simpson's Pippin, Simpson's Seedling.]—Originated from the seed of a tree which had itself been raised from a seed of the Newtown Pippin, by a lady of the name of Ord, at Purser's-Cross, near Fulham. Size, medium; form, oblong oval; colour, green, tinged with red; stalk, long and rather slender; eye, small; flesh, greenish white; flavour, rich and perfumed; duration, from December till March; habit, healthy, hardy, a tolerable bearer; and a second-rate dessert fruit.

93. Ortley Apple.—Originated in New Jersey, in North America. Size, rather above the medium; form, nearly oval; colour, clear yellow on the shaded side, bright scarlet with russet spots on the side next to the sun; stalk, slender; eye, large and shallow; flesh, yellowish; flavour, of the highest order; duration, from November till April; habit, slender, middling bearer, deserving of a wall in most gardens; and one of our very best table apples.

94. Orange Pippin. [*Syn.*, Bland's Orange Pippin.]—Originated with Bland, a

market-gardener at Hammersmith, about the middle of the last century. Size, small; form, roundish, flattened at both ends; colour, light orange; eye, large; stalk, short; duration, in October; habit, moderate grower, forming upright shoots, well calculated for dwarf training; comes early into bearing and is very prolific.

95. Oslin. [*Syn.*, Oslin Pippin, Arbroath Pippin, Orgeline.]—Originated, it is said, at Arbroath, in Forfarshire. Size, medium; form, roundish; colour, at first, light green, changing as it ripens to a bright lemon; stalk, short and thick; eye, very prominent; flesh, yellowish; flavour, rich and peculiarly pleasant; duration, in August, to be eaten from the tree; habit, hardy and a good bearer, and one of our very best summer table apples.

96. Oxnead Pearmain. [*Syn.*, Earl of Yarmouth's Pearmain.]—Originated at Oxnead, near Norwich. Size, small; form, conical; colour, generally green, but sometimes tinged with pale brown on the side next to the sun; stalk, long and slender; eye, very small; flesh, pale green; duration, from November till April; habit, slender, very hardy, and an excellent bearer.

97. Passe Pomme Rouge.—Introduced from France by Sir P. Stephens. Size, medium; form, nearly oval; colour, fine light red; duration, the beginning of August; habit, slender, well adapted for dwarf training, rather delicate, and although a good bearer, one tree of it is sufficient in a large garden, on account of its not keeping above a few days.

98. Passe Pomme d'Automne.—Introduced from France by Sir P. Stephens. Size, medium; form, nearly oval; colour, vermillion; flesh, tinged with red; duration, October and November; habit, delicate, a good bearer; leaves, large and downy; a handsome table apple.

99. Padley's Pippin.—Originated with the late Mr. Padley, of the Royal Gardens, Hampton Court, about thirty years ago. Size, small; form, somewhat flat; colour, dull yellow, covered with grey russet, slightly tinged with orange where most exposed to the sun; stalk, long and slender; eye, small; duration in November and December; habit, moderate grower, an abundant bearer, and an excellent dessert fruit.

100. Petite Jean.—Introduced from Jersey. Size, small; form, oval; colour, pale yellow where shaded, brilliant red where exposed to the sun; flesh, white; eye, small; stalk, very short; duration, from November till April; habit, healthy, an abundant bearer, and excellent dessert fruit.

101. Pile's Russet.—Originated at an early period, as it is described by Miller; but how, or when, is not recorded. Size, above medium; form, rather irregular; colour, pale green, tinged with green and covered with a thickish russet; stalk, short; eye, nearly closed; flesh, greenish yellow; flavour, saccharine and aromatic; duration, from November till April; habit, rather slender, healthy, an abundant bearer, and an excellent table fruit, particularly when it becomes fully ripened, in March and April.

102. Pine-Apple Russet. [*Syn.*, Hardingham's Russet.]—Originated, it is conjectured, in the neighbourhood of Norwich. Size, above medium; form, roundish oval; colour, greenish yellow, spotted with white dots on one side, and nearly covered with yellowish russet on the other; stalk, about an inch in length; eye, small; flesh, pale yellow; flavour, spicy and aromatic, somewhat resembling that of the pine, from whence it derives its name; duration, in September and October; habit, healthy and robust, an excellent bearer; it is one of our very best table apples, and deserving of more extensive cultivation.

103. **Pitmaston Nonpareil.** [*Syn.*, St. John's Nonpareil, Russet Nonpareil.]—Originated at Pitmaston, near Worcester. Size, medium; form, compressed at both ends, like all Nonpareils; colour, greenish yellow, covered with a thin coat of russet; stalk, short; eye, open and rather large; flesh, greenish yellow; flavour, aromatic, having the perfume of the Nonpareil in a strong degree; duration, in November and December; habit, slender in wood, healthy, an excellent bearer, and a first-rate table fruit.

104. **Powell's Russet.**—Size, considerably under the medium; form, flattened at both ends and destitute of angles; colour, yellowish green, thinly covered with russet; stalk, short and slender; eye, small; flesh, clear pale yellow; flavour, that of the best Nonpareils; duration, from November till January; habit, slender, healthy, a good bearer, and one of our best Russets, perhaps the very best of them for table use.

105.—**Pomme Roi.**—Introduced from Normandy to Sussex, where it is more generally cultivated than any where else. Size, above medium; form, irregular, approaching to oval; colour, deep blush next the sun, light red where shaded; flesh, white; duration, from October till December; habit, healthy, upright in growth, good bearer, and excellent for culinary purposes.

106. **Philadelphia Pippin.** [*Syn.*, Ditchingham Pippin.]—Introduced from America. Size, above medium; form, nearly round; colour, yellowish grey, slightly red on the side next the sun; stalk, short; eye, small; flesh, white; duration, from September till January; habit, hardy, and a great bearer, the fruit produced singly; an excellent culinary fruit.

107. **Red Astracan.** [*Syn.*, not the Transparent Apple of the Scotch gardens, or Pomme d'Astracan of the French, with which it is often confounded.]—Originated in Russia, and introduced here from Sweden by William Atkinson, Esq., some time prior to 1820. Size, about the medium; form, roundish, sometimes slightly angular; colour, beautifully red or crimson nearly all over, particularly when fully exposed to the sun; stalk, short; eye, rather large; flesh, pure white; flavour, rich and pleasant when newly gathered, turning mealy in a few days; duration, the two middle weeks in August; habit, slender, healthy, and a most abundant bearer; a very beautiful and excellent table fruit.

108. **Red Ingestrie.**—Originated from a seed of the Orange Pippin, by Thomas Andrew Knight, Esq., about 1800, and named by him from Ingestrie, one of the seats of the Earl Talbot. Size, below the medium; form, roundish oblong; colour, bright yellow, tinged with red; stalk, slender and short; eye, regular, and of the ordinary size in proportion to the size of the fruit; flesh, yellowish; flavour, resembling that of the Golden Pippin; duration, in October; habit, slender, healthy, and a moderate bearer; one of our best autumn table fruits.

109. **Red Quarenden.** [*Syn.*, Devonshire Quarenden, Sack Apple.]—Originated either in Devonshire, Somersetshire, or Gloucestershire, but which it is not exactly known; it is much cultivated in the two latter counties. Size, above the medium; form, round, slightly compressed at the ends; colour, deep red crimson; stalk, short and thick; eye, slightly depressed; flesh, greenish white; flavour, very agreeable when newly gathered; duration, the two middle weeks in August; habit, strong, healthy, and a very abundant bearer; one of our best early table or kitchen fruits.

110. **Reinette Franche.** [*Syn.* French Reinette.] — Introduced from France. Size, above medium; form, flattish; colour, pale yellow, with numerous russety specks; eye, small; stalk, short and thick; flesh, yellowish white; duration, from November till February; habit, healthy, moderate bearer, and fit for the dessert.

111. **Revelstone Pippin.**—Originated in Scotland. Size, medium; form, irregular; colour, greenish yellow on the shaded side, spotted with russet, and nearly bright red on the side next to the sun; stalk, short and thick; eye, large; flesh, yellow; flavour, sweet and pleasant; duration, the last week in August, and the two first weeks in September; habit, healthy, and an abundant bearer; it is an excellent table fruit.

112. **Ribston Pippin.** [*Syn.*, Formosa Apple, Travers Apple, Glory of York.]—Originated at Ribston Hall, in Yorkshire. Size, medium; form, somewhat irregular; colour, yellowish or green on the shaded side, often russety, mottled with red on the side next the sun, particularly when grown against a wall; stalk, slender, about half an inch in length; eye, rather small; flesh, pale yellow; flavour, deliciously aromatic; duration, from October till April or May; habit, liable to canker in moist soils, an abundant bearer, and ought to find a place in every garden; this is one of our very best table apples.

113. **Royal Reinette.**—Originated, it is conjectured, in Sussex, and is much cultivated in that county. Size, under the medium; form, somewhat conical; colour, yellow where shaded, striped with delicate red next the sun, and, like most of the Reinettes, sprinkled with numerous white dots; stalk, very short; eye, large and open; flesh, pale yellow; flavour, rich and pleasant; duration, from November till May; habit, healthy, a good bearer, and a second-rate table apple.

114. **Robinson's Pippin.**—Size, small; form, oval, and flattened at both ends; colour, brownish yellow, rather russety towards the sun; stalk, short and slender; eye, open, and very shallow; duration, from December till May; habit, slender, fruit produced in clusters at the end of the shoots; an excellent dessert fruit.

115. **Royal Russet.** [*Syn.*, Reinette de Canada grise, Passe-Pomme de Canada.]—Size, large; form, rather flat than oblong; colour, yellowish green, thickly covered with grey russet; stalk, very short; eye, rather small; flesh, greenish white; flavour, slightly aromatic, with a considerable degree of pleasant acidity; duration, from November till May, or later; habit, less liable to canker than the Old Royal Russet, and a good bearer; it is one of our very best culinary apples.

116. **Royal Pearmain.** [*Syn.*, Herefordshire Pearmain.] — Size, large; form, oblong, inclining to conical; colour, pale yellowish green, interspersed with grey, russety specks on the side next to the sun; eye, small; stalk, short and slender; flesh, greenish yellow; duration, from November till February; habit, healthy, and generally free from canker and blight, especially if planted in a dry bottomed soil; an excellent dessert fruit, and although of many years standing in this country, is much less cultivated than it ought to be.

117. **Royal Reinette.**—Size, below medium; form, slightly conical; colour, yellow, sprinkled with a few dark spots on the side most shaded, but on the opposite stained with brilliant red, the whole surface highly polished and shining;

flesh, pale yellow; eye, large; stalk, very short; duration, from November till May; habit, healthy, and a good bearer, much cultivated in Sussex, where it is esteemed one of their best dessert apples.

118. Ross Nonpareil.—Originated in Ireland. Size, medium; form, roundish, not at all angular; colour, russety green, stained with red on the side next the sun; eye, small; stalk, short, for a Nonpareil; flesh, greenish white; duration, from November till April; habit, healthy in all soils, a great bearer, deserving of general cultivation as a dessert fruit.

119. Scarlet Nonpareil. [*Syn.*, Kirk's Scarlet Nonpareil.]—Originated, according to Lindley and others, in a garden of a public-house at Esher, Surrey, and by Salisbury, said to have been raised from seeds, at Kimpton Park, near Sunbury, Middlesex. Size, medium; form, similar to other Nonpareils; colour, greenish yellow where shaded, deep red next the sun; stalk, very variable in length and thickness; eye, shallow; flesh, yellowish white; flavour, of the highest order; duration, from November till April; habit, slender, hardy, and a great bearer; it cannot be too extensively cultivated, as it is a dessert fruit of the first class.

120. Summer Golden Pippin.—Size, under the medium; form, similar to the Old Golden Pippin; colour, bright yellow, tinged with orange; stalk, short; eye, shallow; flesh, whitish; flavour, sweet and agreeable, and destitute of that perfume peculiar to the Old Golden Pippin; duration, from the end of August to the middle of September; habit, healthy, and a good bearer; it is both an excellent and beautiful dessert fruit.

121. Sam Young. [*Syn.*, Irish Russet.]—Originated in Ireland, and brought into notice by Mr. Robertson, a respectable nurseryman of Kilkenny, and an excellent Pomologist. Size, under the medium; form, nearly globular; colour, bright yellow, interspersed with numerous brown spots, and russety red next the sun; eye, wide and open; stalk, short; flesh, yellowish; duration, from November till February; habit, a healthy, moderately strong tree, and as a dessert fruit inferior to few of our modern varieties.

122. Siely's Mignonne. [*Syn.*, Pride of the Ditches.]—Introduced into notice about forty years ago, from Norwich, where some trees of it grew in the castle ditches, which gave rise to the above synonyme. Size, below the medium; form, nearly round; colour, yellow, covered with a thick, grey, russet netting, giving the skin a scabrous appearance; flesh, greenish yellow; duration, from November till February; habit, rather tender, slender in growth, but well calculated for dwarf training, and worth cultivation every where as a dessert fruit.

123. Sweeney Nonpareil.—Originated in 1807, at Sweeney, in Shropshire. Size, large for a Nonpareil; form, rather irregular, when compared with the old, or with the scarlet Nonpareils; colour, green where shaded, sometimes a fine red next the sun; stalk, slender, about an inch in length; eye, small; flesh, greenish yellow; flavour, saccharine and acid very pleasantly combined; duration, from November till April; habit, healthy, and an abundant bearer; it is a second-rate dessert fruit.

124. Stone Pippin. [*Syn.*, White Pippin, White Stone Pippin.]—Size, medium; form, oblong, tapering towards the crown; colour, smooth pale green, turning yellow when kept a few weeks; eye, small; stalk, slender; duration, from No-

vember till August; habit, hardy, attaining a large size, and a most abundant bearer. As a culinary fruit, few are more worthy of cultivation.

125. Striped Beaufin.—Originated, most probably, in some part of Norfolk. Size, large; form, somewhat irregular; colour, green, tinged with dull salmon, or dull red, all round the fruit; eye, large; stalk, short; flesh, pale green; duration, from October till May; habit, hardy, and worth extensive cultivation as a culinary fruit.

126. Scarlet Pearmain. [*Syn.*, Bell's Scarlet.]—Size, medium; form, conical; colour, deep red, with a little yellow on the shaded side, glowing crimson on the side next the sun; eye, medium sized; stalk, slender; flesh, white; duration, from September to December; habit, healthy, a good bearer, and a very handsome dessert fruit.

127. Scarlet Crofton.—Originated in Ireland. Size, medium; form, flattish round; colour, yellow russet, bright red and russet on the sunny side; eye, wide; stalk, short; flesh never becoming mealy; duration, from October till January; habit, healthy, abundant bearer, and an excellent dessert apple.

128. Summer Broaden. [*Syn.*, Summer Colman.]—Originated, like many other valuable apples, in some part of Norfolk. Size, above medium; form, nearly globular, slightly angled on the sides; colour, yellowish green, tinged with pale brown on the sunny side; flesh, greenish white; duration, in October and November; habit, tree small growers, but great bearers; it is a valuable culinary fruit.

129. Sykehouse Russet. [*Syn.*, Prager of the Dutch.]—Originated at Sykehouse, in Yorkshire. Size, medium; form, roundish, and flattened at the ends; colour, greenish yellow where shaded, slightly covered with russet, brownish red next the sun; stalk, very variable, both in length and thickness; eye, open, deeply sunk; flesh, whitish yellow; flavour, pleasantly sub-acid; duration, from December till April; habit, hardy, and a good bearer. Mr. Lindley observes, that its young wood is somewhat long-jointed, very straight and erect, and grows to a greater length in one season than any other apple he has propagated; it is a first-rate dessert fruit.

130. Wheeler's Russet.—Size, medium; form, irregular, somewhat flat; colour, yellowish grey russet in the shade, sprinkled with a lively brown on the side next the sun; eye, small; stalk, short; flesh, greenish white; duration, from November till May; habit, tree very hardy, and an excellent bearer in all soils except a strong, deep, damp loam, in which it soon cankers and dies; an excellent dessert or culinary fruit.

131. White Russet.—Originated in Ireland; size, large; form, nearly round, but slightly angular on the sides; colour, yellowish russety green, slightly red on the sunny side; stalk, short; duration, in November and December; habit, tree healthy, and a good bearer; a dessert fruit of the second order.

132. White Spanish Reinette. [*Syn.*, Fall Pippin, Cobbett's Fall Pippin, Large Fall Pippin.]—Originated in America, and appears to have been early introduced into this country, as trees of great age and size exist in several parts of Sussex. It was, however, brought into notice by the late Mr. Cobbett, who imported it for sale from its native country. Size, very large; form, roundish oblong; colour, yellowish green, tinged with orange on the sunny side; flesh, white; eye, large; stalk, short; duration, from November till March; habit, healthy, and an abundant bearer in good situations, but, like many American apples, requires

the best climates our country affords. As a dessert or culinary apple, it is extremely valuable.

133. **Winter White Calville.** [*Syn.*, Calville blanche d'Hiver.]—Size, large; form, irregular; colour, greenish yellow till ripe, when it becomes bright yellow tinged with red; stalk, slender, and about three-quarters of an inch in length; eye, small; flesh, white; flavour, exceedingly pleasant; duration, from December till March or April; habit, robust, hardy, and a moderate bearer; it is an excellent kitchen fruit, and one of the best apples met with in France, where it is much cultivated.

134. **Winter Pearmain.** [*Syn.*, Old Pearmain of the Herefordshire orchards.]—Size, medium; form, that of other pearmains; colour, green, slightly red on the side next the sun, often marked with darkish spots, particularly on old trees, and when they are much shaded, or crowded with their own wood; stalk, short and slender: eye, small; flesh, pale green; duration, from November till March; habit, moderately robust, a good bearer, and an excellent winter dessert fruit.

135. **Wyken Pippin.**—Originated at Wyken, near Coventry, from a seed brought from France or Holland. Size, below medium; form, round, and flattened at both ends; colour, yellowish green, tinged with brown on the side next the sun; stalk, short; eye, small; flesh, greenish yellow; flavour, somewhat musky; duration, from October till January; habit, hardy, healthy, and a very great bearer; a second-rate dessert fruit.

136. **Yorkshire Greening.**—Originated, it is supposed, in Yorkshire, where it has been long cultivated. Size, considerably above the medium; form, flattish and irregular; colour, dark green; stalk, short and thick; eye, flat; flesh, greenish white; flavour, pleasant acid; duration, from November till May; habit, robust, hardy, and a good bearer; it is one of our most valuable kitchen fruits.

PROPAGATION OF THE APPLE.

The Apple is propagated either by seeds, layers, cuttings, budding, grafting, or suckers; and each of these processes is so important in itself, that, to exhibit a sufficiently clear view of them, it will be necessary to consider them separately.

Seeds.—For the reproduction of all plants that produce seeds, or rather of all plants that produce visible ones, the most usual process, and especially that pointed out by Nature, is by sowing these seeds. It is also the mode by which new or improved varieties of plants or fruits are to be obtained. It must not, however, be understood that every plant or fruit so originated is improved in its condition by this process, for we find many very inferior varieties, both of flowers and fruits, so raised. We are as yet entirely ignorant of the cause which produces this tendency to change for the better or the worse. "Philosophers," says Mr. Lindley, "are unacquainted with the reason why there should be any tendency to variation from the characters first stamped on any species by nature; but all know that this tendency does exist, and in a most remarkable degree in many species. There is in all beings a disposition to deviate from their original nature when cultivated, or even in a wild state; but this disposition is so strong in some as to render them particularly well adapted to become subject to domestication; for instance, the dog, the pigeon, and the barn-yard fowl, are cases in which this tendency is most strongly marked in animals, and domesticated fruits are a parallel case in the vegetable world."

"Without, then, vainly endeavouring," says the same high authority, "to discover the cause of this disposition to form varieties, let us take it as a naked fact that the disposition exists. Cultivators increase this disposition chiefly in two ways,—either by constantly selecting the finest existing varieties for seed, or by intermixing the pollen and stigma of two varieties for the purpose of procuring something of an intermediate nature. The ancients were unacquainted with either of these practices, and consequently their gardens contained few things which would now be deemed worthy of cultivation. The power of obtaining cross-bred varieties at pleasure, has only existed since the discovery of the sexes in plants; but, as it exerts a most extensive influence over alterations in the vegetable kingdom, it may be considered the most important controlling power which we possess."

If this power, however, is left to the simple operations of nature, although it would, even in that case, produce a change of condition to a certain extent, yet that change is seldom found to be sufficiently marked or certain, to induce us to leave the matter to mere chance alone. No doubt but that many, if not most of our old and good apples have been thus accidentally produced; but since the existence of the sexual distinctions has been ascertained and scientifically understood, more certain and complete means have presented themselves for our guidance.

Although the discovery of the sexes in plants is attributed to the great Swedish naturalist Linnæus, the founder of the sexual system of botany, the knowledge of this organization was known to some, and hinted at by others, of our own countrymen before his day. The great Lord Bacon, who has been styled the Prophet of the Arts, suspected that it was possible to cross the breed of plants, and to produce kinds, by art, as novel as those which nature has sometimes produced by accident.

"The compounding or mixture of kinds in plants," says Lord Verulam, "is not found out; which, nevertheless, if it be possible, is more at command than that of living creatures; wherefore it were one of the most notable experiments touching plants to find out, for so you may have great variety of new fruits and flowers yet unknown. Grafting does it not; that mendeth the fruit, it doubleth the flowers, &c.; but it hath not the power to make a new kind; for," he adds, "the scion overruleth the stock."

Professor Bradley, who wrote about the beginning of the last century, says distinctly, that this subject has been accomplished; but the exact method was not then clearly understood, as we find from his recommending only the bringing together the branches of different trees while in bloom.

The means used in the process of artificially fecundating the stigma or female parts of the blossom of one flower with the pollen or male dust of another, have been beautifully described and explained by Knight and others. That eminent Pomologist has obtained thousands of apple-trees from seeds, many of which are of first-rate quality, by cutting out the stamens of the blossoms to be impregnated before their own pollen was ripe enough for the purpose, and afterwards, when the stigma was mature, by introducing the pollen of the other parent, either by shaking the pollen of it over the flower containing the stigma only, by introducing the flower when deprived of its petals or coloured leaves, or by transferring the pollen upon the point of a camel hair pencil from the one flower to the other. By these means he prevented the possibility of the natural fecundation of the blossom within itself, and thus greatly increased the chances of obtaining intermediate varieties by making use of two distinct parents.

This process is called cross-impregnation, and is in its nature highly curious. Mr. Lindley describes the action as follows:—"Pollen (the male dust) consists of extremely minute hollow balls, or bodies; their cavity is filled with fluid, in which swim particles of a figure varying from spherical to oblong, and having apparently spontaneous motion. The stigma (the female organ) is composed of a very lax tissue, the intercellular passages of which have a greater diameter than the moving particles of the pollen.

"When a grain of pollen comes in contact with the stigma, it bursts, and discharges its contents among the lax tissue upon which it has fallen. The moving particles descend through the tissue of the style, until one, or sometimes more of them, finds its way, by routes specially destined by nature for this service, into a little opening in the integuments of the ovalum or young seed. Once deposited there, the particle swells, increases gradually in size, separates into radicle and cotyledons, and finally becomes the embryo, that part which is to give birth, when the seed is sown, to a new individual.

"Such being the mode in which the pollen influences the stigma, and subsequently the seed, a practical consequence of great importance necessarily follows, viz., that in all cases of cross-fertilization the new variety will take chiefly after its polliniferous or male parent; and that at the same time it will acquire some of the constitutional peculiarities of its mother."

In making these experiments it should be observed, that particular attention should be paid to the sorts operated upon, because impregnation will never or very rarely take place between different species unless they are nearly related to each other; and we can state, on the authority of Lindley, "that the offspring of the two distinct species is itself sterile, or if it possesses the power of multiplying itself by seed, its progeny returns back to one or other of the parents. Hence it seldom or never has happened that domesticated fruits have had such an origin. We have no varieties raised between the apple and the pear, or the quince and the pear, or the plum and the cherry, or the gooseberry and the currant. On the other hand, new varieties obtained by the intermixture of two pre-existing varieties are not less prolific, but, on the contrary, often more so than either of their parents."

The kinds of apples that it would be advantageous to cross by artificial impregnation appear to be those which have a great many qualities in common, and some different qualities. Thus it would be proper to cross the Golden Pippin with other pippins, and even with some rennets, but it would be improper to cross it with codlins or the larger-growing kinds. The numerous varieties of pippins raised by Knight and others have been obtained by following the above rule. It is no doubt true, that a small apple, say, for example, the Golden Pippin, crossed with a much larger sort, will produce a variety sufficiently distinct from either; but it is almost equally certain that this new variety will be of very inferior quality to either; "the qualities of both parents," as Mr. Loudon has very justly observed, "of so very opposite natures being, as it were, rudely jumbled together in the offspring."

Apple trees are annually raised in considerable numbers for the purpose of obtaining stocks whereon to graft other approved sorts. This kind of stock is called free stock, and is the progeny of any kind of apple seed that may be most conveniently obtained; at least such is the practice in the British nurseries. The Norman orchardists pay more attention to the subject, of which notice will be taken in the article Stocks.

The seeds being obtained, they should be sown as soon after they are ripe as possible, that is, in autumn. The soil should be rich and light, and the situation warm and dry. The usual precaution to guard them against the attacks of mice during winter should be taken. The autumn following the young plants will be fit to transplant into nursery rows, if the object be to use them as free stocks; but if to obtain new varieties of fruit, then they should be planted out where they are to remain to produce their fruit, and for this purpose there can be no better situation, if upon a small scale, than the back part of a shrubbery, where they will occupy but little space, and, during their flowering season at least, be extremely beautiful. If upon a large scale, it would be more advisable to plant them in the margins of young plantations, or in hedge-rows, where the soil is good. Williams, of Pitmaston, a successful cultivator of the Apple, informs us, (*Horticultural Transactions*, vol. i. p. 333,) that he has found such seedling Apples as were allowed to retain their lateral or side shoots from the ground upwards, but so disposed that the foliage of the upper shoots may shade those under them as little as possible, and removing only trifling shoots. From observations made by him on the form and appearance of the leaves of his seedling apple trees, he thought it possible, by following the above mode, to forward the peculiar organization of the foliage necessary to the formation of blossom buds. He informs us that he succeeded so far by this plan as to produce fruit from seedling apples at four, five, and six years, instead of eight, ten, or even fifteen years, which is the usual period for trees pruned to naked stems and treated in the usual manner.

Other methods have been had recourse to with the view to accelerate the early production of fruit from seedling trees. That practised by Mr. M'Donald, of Dalkeith, appears to us worthy of notice. In 1808, he impregnated the blossom of the Nonpareil with the pollen of the Golden Pippin and Newtown Pippin. From the best specimens of the fruit so produced he selected the seeds, which he sowed in pots, and planted them in a frame. The progeny, which consisted of eight or nine plants, he transplanted, in 1809, into open ground. In 1811, he selected a few of the strongest of these plants, and put them singly into pots. In 1812, one of the plants showed fruit-buds: observing this, he took some twigs from the tree, and grafted them on a healthy wall tree, and in 1813 he had fruit. In 1816, his seedling trees produced several dozen of apples, and also those he had grafted, which latter, he observes, were the largest.

It is very difficult and perhaps impossible to judge from the appearance of the seedling trees which will be the best, or come earliest into a fruitful state; some pretend to determine this from the appearance of the leaves, and therefore select, at the age of two or three years, only such as have broad and roundish leaves, and throw away such as have narrow and pointed leaves. Mr. Knight appears to be undecided on this subject, for he observes, "An estimate may be made of their good or bad qualities at the conclusion of the first summer, by the resemblance the leaves bear to the highly cultivated or wild kinds," and this, he observes, was remarked by the writers of the last century. "The plants whose buds in the annual wood are full and prominent, are usually more productive than those whose buds are small and shrunk into the bark;" and further, he says, "the width and thickness of the leaf generally indicate the size of the future apple, but will by no means convey any correct idea of the merits of the future fruit. Where these have the character of high cultivation, the qualities of the fruit will be far removed from those of the native species; but the apples may be insipid or highly flavoured, green or deeply coloured, and of course well or ill calculated to answer the purpose of the planter. An early blossom in the spring, and an early change of colour in the autumnal leaf, would naturally be supposed to indicate a fruit of early maturity; but I have never been able to discover any criterion of this kind on which the smallest dependence may be placed."

The eminent horticulturist just quoted has paid more than ordinary attention to the rearing of apple trees from seeds, not only with the view of obtaining new and improved varieties, but also, as he thinks, of perpetuating even the best of the old and valuable sorts, which he believes to be growing rapidly into decay, having outlived the natural term of their useful existence. In his Treatise on the Apple and Pear, and in various papers in the Transactions of the Horticultural Society, Mr. Knight has endeavoured to substantiate his theory; but we believe that the generality of physiological writers, both in this country and on the Continent, entertain very different opinions on this subject. If the Apple is now deteriorated in merit from what it once was, which is a matter of extreme difficulty to determine, it may be attributed to one of the following causes, viz., that the trees are either in the last stage of decay from being perpetuated by grafting beyond the natural period of their useful existence, as asserted by Knight, or that the return of more genial summers, as believed by Williamson, Speechly, and others, will restore to us from old trees as good fruit as heretofore.

LAYERS.—The Apple is seldom propagated by this process, unless for obtaining codlin stocks; the operation differs not from that in general ing or tongue-grafting, side-grafting, crown-grafting, cleft-grafting, saddle-grafting, root-grafting, shoulder or chink-grafting, flute-grafting, pig or terebration-grafting. Of these, two sub-varieties of saddle-grafting were sometimes practised by Mr. Knight, and a sub-variety of root-grafting was also used by the same lamented gentleman.

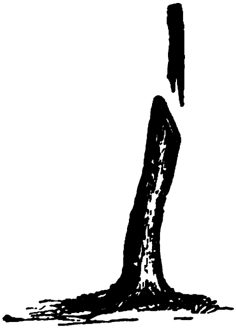
Of all these varieties one or two only are in general use for propagating the Apple in the British gardens, and those who are expert at whip, side, and root-grafting may accomplish all that is absolutely required. The French have, with their usual faculty of invention in little matters, enlarged this number to a very extraordinary extent. The late Professor Thouin has described above forty methods of grafting, many of which are not only difficult to accomplish, but when done possess no real advantage over the more ordinary modes. Those particularly interested in these matters may refer to the article *Greffe*, in *Nouveau Cours complet d'Agriculture*, tom. xvi., and also in *Monographie des Greffes* (4to, Paris, 1821).

Inarching or grafting by approach is another modification of this art, but is not often employed on the Apple tree. There are two varieties of this mode, viz., side inarching and crown inarching; the former is most generally in use. Professor Thouin has enumerated above thirty-seven sub-varieties of inarching.

THEORY OF GRAFTING.—Keith, in *Physiological Botany*, vol. ii. p. 277, has ably elucidated this art. After referring to its supposed origin, which we have already spoken of, viz., the natural union of two branches, he proceeds :—" This is what may be termed a natural graft, in opposition to an artificial graft, of which it is the model and prototype : the whole of the art of grafting being founded upon the capacity inherent in plants, of uniting together by the stems in given circumstances, and in a given mode. But the natural graft is always effected by means of the union of the liber of the respective stems composing it; so that the perfection of the art of grafting consists in applying the liber of the graft and stock together in such a manner as shall most facilitate their incorporation. And hence the graft will not succeed, unless the two libers are brought into contact, and closely bound together. Nor will it succeed well, unless the plants engrafted have some natural affinity to one another, as that subsisting between the plum and cherry; in which, and in all other cases, the union is effected by means of a granular and herbaceous substance exuding from between the wood and bark, and binding and cementing together the stock and graft, though not uniting the former layers of wood."

The success of grafting depends mainly upon the property that buds possess of extending roots downwards and shoots upwards, as exemplified in the case of propagation by cuttings; but in grafting, the roots extend themselves between the bark and the wood, and form new layers of wood instead of underground fibres, as in the former case. In grafting there are, however, some other causes necessary to the success of the operation which are not necessary in the case of cuttings. And hence, says Lindley, "it is necessary that an adhesion should take place between the scion and the stock, so that, when the descending fibres of the buds shall have fixed themselves upon the wood of the stock, they may not be liable to subsequent separation. No one can have studied the economy of the vegetable kingdom without having remarked that there is a strong tendency to cohesion in bodies or parts that are placed in contact with each other. This cohesion will always be found to take place in the cellular tissue only, and never in the vascular tissue. In the stems of all such trees as are grafted by orchardists, the cellular tissue is found alive only in the medullary rays and the liber; it is therefore essential, in the first place, that those parts, both in the stock and scion, should be placed in contact. With respect to the medullary rays, these are so numerous and so closely placed that it is scarcely possible that a portion of one stem should be applied to another without the medullary rays of both touching each other at many points. No care, therefore, is required to ensure this, which may be safely left to chance. But in regard to the liber, as this is confined to a narrow strip in both stock and scion, great care must be taken that they are both placed as exactly in contact with each other as possible, so that the line of separation of the wood and bark should, in both stock and scion, be accurately adjusted." It is well known to practitioners how much the success of the operation depends upon this circumstance; but, as the authority last quoted continues, "There are other reasons why that accuracy in adjusting the line between the bark and wood of the stock and scion is so important. It is at that part that the roots of the latter pass downwards over the former; and it is also there that the substance called *cambium*, which serves for food to the young descending fibres, is secreted. It is obvious, that the more accurate the adjustment of the line separating the wood from the bark, the more ready will be the transmission of young fibres from the one to the other; and that the less the accuracy that may be observed in this respect, the greater the difficulty of such transmission will be. Providing the stock and scion be of exactly the same size, the adjustment can scarcely fail to be accurate in the most unskilful hands; it is in the more common case of the scion being much smaller than the stock, that this is to be most particularly attended to."

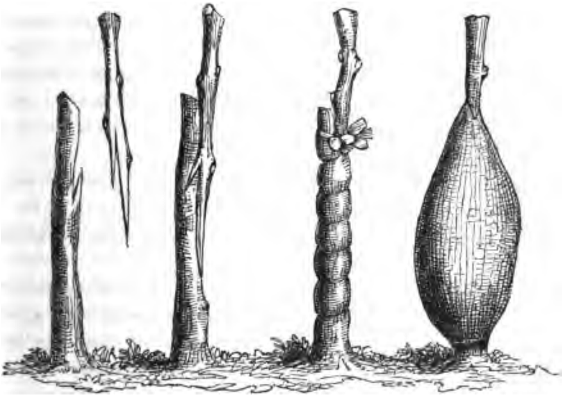
OPERATION OF GRAFTING.—Whip, or tongue-grafting, is the mode most in use in the best fruit-tree nurseries, and is so called from the manner of cutting both the stock and scions in a sloping direction on one of their sides, so that when brought together they fit exactly, and thus may be tied together in the manner of a whip thong to the handle. In former times this species of grafting was performed without a slit or tongue, and in that case the former term was more applicable. Subsequent practice has added the slit or tongue, which has not inaptly given rise to the latter term. In performing the first, nothing more is required than merely to cut obliquely at corresponding angles to the stock and scion, so that when the incisions are brought together they fit exactly: then, the inner barks of both being brought to unite on one side at least, a union takes place, as described above in the theory of grafting.



The process of tying them firmly together with bast, claying, &c., is the same as in the following method. This mode, although not generally used for apples and pears, &c., is much in vogue amongst the propagators of exotic plants, where both stock and scion often happen to be very slender.

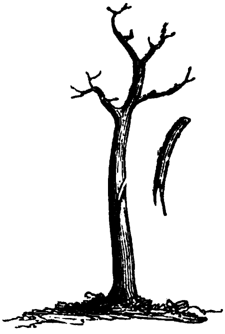
The other variety of this mode, that is, tongue-grafting, is performed as follows:—"The scion and stock being cut off obliquely at corresponding angles, as near as the operator can guess, then cut off the tip of the stock obliquely or nearly horizontally; make now a slit nearly in the centre of the sloping face of the stock downwards, and a similar one in the scion upwards." This is called tongueing. "The tongue or wedge-like process, forming the upper part of the sloping face of the scion, is then inserted downwards in the cleft of the stock; the inner barks of both being brought closely to unite on one side, so as not to be displaced by tying, which ought to be done immediately with a riband of bast, brought, in a neat manner, several times round the stock: this is generally done from right to left, when the scion is placed with the right hand, but from the left to the right, when it is placed with the left hand. The next operation is to clay the whole over an inch thick on every side, from about half an inch or more below the bottom of the graft, to an inch over the top of the stock, finishing the whole coat of clay in a kind of oval globular form, closing it effectually about the scion and every part, so as no light, wet, nor wind may penetrate; to prevent which is the whole intention of claying."

There is another variety of tongue-grafting, recommended by Mr. Cobbett, in his *English Gardener*, pp. 206—209. This, also, has its advantages, which will be readily understood by the following figures and description, though somewhat abreviated:—"The stock being ready, cut it off at three or four inches from the ground, and with a sharp knife cut a thin slip of wood and bark upward, from about two inches below the top of the shortened stock. Make this cut at one pull of the knife, inserting the edge rather horizontally, and when it has gone through the bark and into the wood a little short of the middle, pull straight upwards (see No. 1, *a*, *b*). Then, at less than half way down this, cut a thin tongue (No. 1, *t*), not more than three-eighths of an inch long. Proceed in the same way with the bottom part of the scion; make a sloping cut (No. 2, *c*, *d*) of about the same length as the cut in the stock; then make a tongue (No. 2, *t*) to correspond with that in the stock (No. 1, *t*); but cut upward instead of downward. Then place the scion upon the stock, inserting the tongue of the scion into the tongue of the



stock. Bring the four edges of the bark, that is, the two edges of the cut in the top of the stock, and the two corresponding edges of the cut in the bottom of the scion, to meet precisely; or if the scion be smaller in diameter than the stock, so that its two edges of bark cannot meet those of the stock, then let only one meet, but be sure that one meets precisely. But observe well that this can never be unless the first cut in the stock and that in the scion be perfectly even and corresponding to each other." The parts thus joined will present the appearance of No. 3, the tongues of the stock and scion clasping one another, as at No. 3, *t*; they must now be bound fast together in the usual manner with matting. "A single piece tied on to the stock [as at No. 4] an inch or so below the part grafted, and then wound closely up till it reach the very top of the stock, will, if well done, almost ensure the junction; but, lest parching winds should come and knit up vegetation, it is usual to put on, besides the bandage of matting, a ball of well-beaten clay, sprinkled over with a little wood ashes, so as completely to cover the parts grafted, that is, from an inch below them to an inch above them [as at No. 5]."

Side-grafting is merely a modification of whip or tongue-grafting, and is chiefly used upon wall trees; it is very well adapted to supply the want of a branch in any part of the tree, and also to have a variety of sorts on the same tree. We have found the practice of side-grafting branches of the same tree, or indeed of any other sort, of advantage in the case of sterile pears, the branches so put on in general coming into a fruitful state the third or fourth year after the operation had been performed.

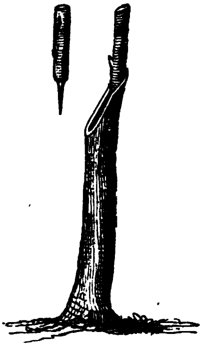


Crown-grafting is principally had recourse to in the case of old or large trees, when headed down, whether near the ground, as in the case of dwarfs, or when the larger branches of standards are cut off close to the trunk or stem. From the scions being introduced between the bark and wood, it has been often called grafting in the bark or rind.

The operation is thus described in the Ency. of Gard.:—" In performing the operation, first cut or saw off the head of the stock or branch horizontally or level, and pare the top smooth; then cut one side of each scion flat and somewhat sloping, an inch and a half long, forming a sort of shoulder at the top of the slope, to rest upon the crown of the stock; then raise the rind of the stock with the handle of a budding knife, so as to admit the scion between it and the wood two inches down; which one, place the scion with the cut side next the wood, thrusting it down far enough for the shoulder to rest upon the top of the stock; and in this manner may be put three, four, five, or more scions in one large stock or branch."

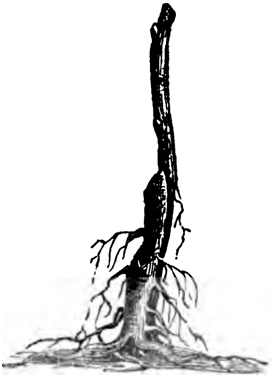
If some pains be taken in cutting down an old or large unproductive tree, or one of inferior merit, so that the larger branches be cut off at proper distances, and the scions placed on them with judgment, a very handsome and large tree may in a short period be produced, which would not be the case if headed back close to the stem, as most generally is the case.

Cleft or stock-grafting is another mode made use of in operating upon old trees or large stocks where the bark or rind is not too thick. The head of the stock or branch being cut off in a sloping direction, a slit is made the contrary way in the top of the stock, deep enough to receive the scion, which should be cut sloping like a wedge, so as to fit the slit made in the stock; care must be taken that the side of the wedge which is to be placed outward is to be thicker than the other, and in placing the scion into the slit it must be so adjusted that the rind of the scion join that of the stock, for if these do not unite, the grafts will not succeed, as has been already noticed. When the grafts, which may be either one, two, three, or more, according to the size of the stock, are put in their places, the whole should be clayed over as in the case of crown-grafting.



Saddle-grafting is a method well adapted for standard trees grafted at standard height, but they should not be much larger in diameter than the scions to be put on them. In performing the operation, the head of the stock is cut in a wedge-like form; the scion is then split up the middle, after which each half is pared off to a tongue-shape, and is then placed on the wedge-shaped top of the stock, taking care that the inner barks of both stock and scion join on one side at least. The whole is made fast with bast, and clayed over.

A sub-variety of saddle-grafting is described by Mr. Knight, in the 5th vol. of the *Transactions of the Horticultural Society*, which he thinks useful in the case of very slender shoots having to be operated upon. His description is as follows:—As this mode has rarely "or never been properly executed, it will be necessary that I describe the motion of the sap as I conceive it to be, at the period when grafts are most advantageously inserted. The graft first begins its efforts to unite itself to the stock just at the period when the formation of a new internal layer of bark commences in the spring; and the fluid, which generates this layer of bark, and which also feeds the inserted graft, radiates in every direction, from the vicinity of the medulla, to the external surface of the alburnum. The graft is of course most advantageously placed when it presents the largest surface to receive such fluid, and when the fluid itself is made to deviate least from its natural course. This takes place most efficiently, when a graft of nearly equal size with the stock is divided at its base and made to stand astride the stock, and when the two divisions of the graft are pared extremely thin at and near their lower extremities, so that they may be brought into close contact with the stock (from which but little bark or wood should be pared off) by the ligature. I have adopted this mode chiefly in grafting cherry trees, and I have rarely ever seen a graft fail, even when the wood has been so succulent and immature as to preclude every hope of success by any other mode."



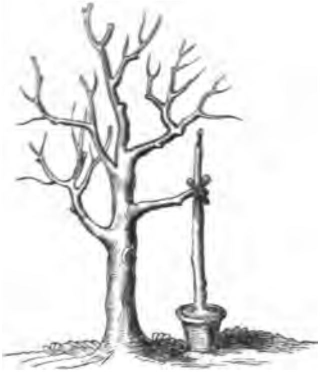
There is another sub-variety of saddle-grafting, described also by Knight as being almost confined to Herefordshire, the chief merit of which appears to be, that its season of being performed is after that of the other methods in general use.

Root-grafting is seldom had recourse to in the case of fruit trees, but may be employed when stocks are not to be had, which is seldom the case. It is found of great service, however, in the propagation of exotic plants. The American orchardists employ this mode to a considerable extent, and select the roots of trees of the same species, that have been dug up and are furnished with a few fibres: on such roots they place scions by any of the ordinary modes of grafting, and afterwards plant them so deep in the ground that the part of union is covered with the mould. The roots of the common white thorn have been used in this country as a stock both for the apple and the pear. Mr. Knight, who was fertile in horticultural inventions, relates a case of root-grafting performed some years ago by himself, and published in the *Horticultural Transactions.* "Transplanting, many years ago, some pear stocks from a seed bed, of which the soil was soft and deep, I found that the first-emitted roots of many of them descended a foot or more perpendicular into the earth, before they divided into any lateral ramifications; and as I did not like to replant the young trees with such an inconvenient length of perpendicular root, I cut off about six inches from each. The amputated parts were then accurately fitted and bound, as in splice or whip-grafting, to scions of pear trees, which were selected as nearly as possible of the same size; and the roots, with their attached branches, were deposited in the ground as cuttings, so deep, that the whole of the root, and about an inch of the scion, were covered. The soil was then drawn up with the hoe on each side of the plants, which were placed in rows, so that one bud only of each graft was above the soil, and another just within it. These grafts succeeded perfectly well, and I have subsequently repeated the same experiment with equal success upon the apple, the plum, and the peach. In the greater part of these experiments, the roots were perfectly cleansed from mould by washing, before they were fitted to the graft, and were then placed in wet moss, till a sufficient number were ready to carry to the nursery: a common dibber only was employed in planting them; but the mould was washed into the holes with water, to close it well round the roots, and to supply the place of the clay used in other methods of grafting."

Shoulder or chink-grafting is rarely employed in propagating fruit trees, but is sometimes used in grafting exotic plants.

Flute and pig-grafting are seldom now employed; by the latter mode, Professor Von Mons, of Brussels, grafted an entire tree fifteen feet high on the stump of another of equal diameter growing in another garden.

Inarching or grafting by approach is a species of grafting seldom practised on the ordinary kind of fruit trees, but it is that most generally used in the multiplication of tender exotics. The advantages of this method as regards fruit trees are, however, very great, as in the following case, recommended by Mr. Knight:—"In the last season (1812) a peach tree in my garden, of which I was very anxious to see the fruit, had lost, by the severity of the weather, all its blossoms except two, which grew upon leafless branches. I was very desirous to preserve these, as well as to ascertain the cause why the peach and nectarine under such circumstances fail to acquire maturity. The most probable cause, according to my hypothesis, appeared to be the want of returning sap, which the leaves (if existing) would have afforded, and the consequent morbid state of the branch; I therefore endeavoured to derive the necessary portion of returning sap from another source. To obtain this object, the points of the branches which bore fruit were brought into contact with other branches of the same age that bore leaves; and a part of their bark, extending in length about four times their diameters, was pared off immediately above the fruit. Similar wounds were then made upon the other branches, with which these were brought into contact; and the wounded surfaces were closely fitted, and tightly bound together. An union took place; and the fruit, apparently in consequence of it, acquired the highest state of maturity and perfection."



In carrying the operation into effect two branches are brought close together by bending one or both: should the two plants or trees be growing near together, or if the one be moveable, as, for example, a plant growing in a pot, then it can be so placed as to admit of the close approach of the branches to be operated upon. A portion of the bark is to be removed from each at that part where they most closely come in contact, and the process of tongueing may be used or not, with little difference in the success. When they are properly adjusted, so that the bark, on one side of the scion at least, exactly joins that of the stock, they are to be firmly secured by binding them round with matting, and afterwards clayed over, as in the usual modes of grafting.

Object of Grafting.—The end of grafting fruit-trees is, *first*, to multiply or perpetuate varieties or sub-varieties of any particular kind of fruit, which could not be done with certainty if propagated from seeds.

Secondly, to increase, with greater rapidity, the number of trees of any desired sort, which no other mode of propagation (budding excepted) would accomplish.

Thirdly, to accelerate the fructification of trees which are tardy in producing their fruit.

Fourthly, to improve the quality of fruits; and

Fifthly, to change the sorts of fruit on one tree, and renew its fruitfulness.

SELECTION AND PREPARATION OF SCIONS.—Scions are usually selected from the young wood of the previous season's growth, although Mr. Knight and others have employed the young shoots of the present year's growth, as well as those of several years' standing. For all useful purposes, the former are to be preferred, and should be chosen from the outside lateral branches, in preference to those growing in the centre of the tree, or near its base, which are in general weak from over-shading, and also such as grow near its top, which are in general too strong. The outside lateral shoots are, in general, of medium growth, and are better matured than such as are either too weak or too strong; besides, they are considered better bearers, and reproduce the truest specimens of the fruit of the tree on which they grow. The middle portion of such scions should be preferred, and be cut to a length varying from two buds or eyes to five or six.

Scions are to be cut from the parent tree some time previous to the season of grafting, as long experience has taught us, that it is of great advantage to allow the stock to be in a more advanced state of vegetation than the scion. The end of January, or the beginning of February, is the most proper time for selecting the grafts, although those cut off in November or December, if well kept, are equally good. When they are collected, each sort should be carefully labelled, to prevent mistakes, and they should be sunk in a dry airy border, out of the reach of frost, and kept there till the middle or end of March, at which period the season of grafting usually commences.

This is the practice which long experience has taught gardeners to adopt, and we do not recollect that the theory was questioned, until the publication of the *Domestic Gardener's Manual*, in which the talented author remarks,—"This mode of reasoning appears to me to be founded on the old theory of the exclusive agency of the ascending sap; and it implies that the scion is in a dry and thirsty condition, eager to imbibe the ascending fluid. The electrical theory considers the flow of the sap as an operation of *induction;* that the buds of the twigs are the immediate instruments by which that induction operates; and, therefore, that just in proportion to the identity of condition subsisting between the scion and the stock, will be the speed and certainty with which the union between the two is effected. What experience may finally determine, I know not; but I am prepared to say, that I have instances now before me, all of successful graftings, wherein the scions taken off the tree at the moment of 'grafting in the crown' were more speedily knitted to the stock than others that had been cut off and kept in mould for some weeks before they were wanted."

Selection and Preparation of Stocks.—The stocks which experience has proved to be the most proper for working the Apple upon, are the following, viz.—The *Crab Stock*, the *Free Stock*, the *Paradise Stock*, and the *French Stock*. Notice will be taken of the stocks proper for other fruits in their respective places; but, as the following remarks on the supposed influence of stocks are, to a certain extent, applicable to all, we will notice them here, to prevent repetition:—"In proportion as the scion and the stock approach each other closely in constitution, the less effect is produced by the latter; and, on the contrary, in proportion to the constitutional difference between the stock and the scion, is the effect of the former important. Thus, when pears are grafted or budded on the wild species, apples upon crabs, plums upon plums, and peaches upon peaches or almonds, the scion is, in regard to fertility, exactly in the same state as if it had not been grafted at all; while, on the other hand, a great increase of fertility is the result of grafting pears upon quinces, peaches upon plums, apples upon white-thorn, and the like. In these latter cases, the food absorbed from the earth by the root of the stock, is communicated slowly and unwillingly to the scion: under no circumstance is the communication between the one and the other as free and perfect as if their natures had been more nearly the same; the sap is impeded in its ascent, and the proper juices are impeded in their descent, whence arises that accumulation of secretion which is sure to be attended with increased fertility. No other influence than this can be exercised by the scion upon the stock. Those who fancy that the contrary takes place,—that the quince, for instance, communicates some portion of its austerity to the pear, can scarcely have considered the question physiologically, or they would have seen that the whole of the food communicated from the alburnum of the quince to that of the pear, is in nearly the same state as when it entered the roots of the former. Whatever elaboration it undergoes, must necessarily take place in the foliage of the pear; where, far from the influence of the quince, secretions natural to the variety go on with no more interruption than if the quince formed no part of the system of the individual."—*Lindley.*

The great Lord Bacon, and afterwards Miller, have given their opinions on this subject. The former says, "that the scion over-ruleth the graft quite, the stock being passive only." And the latter distinctly says—"that crab stocks cause apples to be firmer, to keep longer, and to have a sharper flavour;" and proposes that the breaking pears be grafted on quince stocks, to render the fruit more melting, and less gritty and strong, than they naturally are.

The following quotation, bearing upon this subject, is from the fertile pen of Mr. Knight, to whom society is so much indebted for his valuable discoveries in Pomology:—"The effects produced by grafting are similar to those which occur when the descent of the sap is impeded by a ligature, or by the destruction of a circle of bark. The disposition in young trees to produce and nourish blossom buds and fruit, is increased by this apparent obstruction of the descending sap; and the fruit of such young trees ripens, I think, somewhat earlier than upon other young trees of the same age, which grow upon stocks of their own species: but the growth and vigour of the tree, and its power to nourish a succession of heavy crops, are diminished, apparently, by the stagnation in the branches and stock of a portion of that sap, which, in a tree growing upon its own stem, or upon a stock of its own species, would descend to nourish and promote the extension of the roots. The practice, therefore, of grafting the pear tree on the quince stock, and the peach and apricot on the plum, where extensive growth and durability are wanted, is wrong; but it is eligible wherever it is wished to diminish the vigour and growth of the tree, and where its durability is not thought important. When great difficulty is found in making a tree, whether fructiferous or ornamental, produce blossoms, or in making its blossoms set when produced, success will probably be attained in almost all cases, by budding or grafting upon a stock which is nearly enough allied to the graft to preserve it alive for a few years, but not permanently. The pear tree affords a stock of this kind to the apple; and I have obtained a heavy crop of apples from a graft which had been inserted in a tall pear stock, only twenty months previously, in a season where every blossom of the same variety of fruit was destroyed in the orchard by frost. The fruit thus obtained was externally perfect, and possessed all its ordinary qualities; but the cores were black, and without a single seed, and every blossom had certainly fallen abortively, if it had been growing upon its native stock. The experienced gardener will readily anticipate the fate of the scion: it perished in the following winter. The stock, in such cases as the preceding, promotes, in proportion to its length, the early bearing and the early death of the graft."

The Free Stock.—This species of stock is obtained by sowing the seeds of any of the cultivated Apples too often, without any regard to their kind or merits. "The French orchardists," we are informed by Rogers, "particularly in Normandy, are very careful in keeping their free stocks separate, and working upon them only such sorts as they think will best answer the end in view: that is, uniting early grafts with early stocks—late sorts upon stocks raised from late varieties, &c. By such means, the real character of different kinds," he thinks, "is kept more pure, both as respects quality and long-keeping properties,—a practice well worth imitation." This stock is used for trees grafted standard-height.

The Crab Stock.—The Crab stock is obtained by sowing seeds of the wild crab of the woods, preferring those from healthy trees, and keeping the seeds till spring in dry mould, where frost cannot reach them; or they may be sown at once in autumn in the nursery beds. Stocks of this description are considered the best, and are longest lived, and less subject to canker than any other.

The Siberian Crab Stock.—This kind of stock is highly spoken of by Mr. Knight, and is obtained by sowing the seeds of the yellow Siberian Crab. It is thought by him to be preferable for small table or dessert Apples.

The French or Doucin Stock.—This stock is propagated by layers; but our principal supply is obtained from the Continent. They are used principally for grafting trees upon intended to be grown in pots, or planted in miniature orchards, as they are of diminutive growth.

Paradise Stocks.—This stock is also used for dwarf Apples, and for such as are to be grown as espaliers, or planted in miniature orchards. It was the opinion of the late Mr. Salisbury, that Paradise and seedling Apple stocks are more subject to injury from insects than crab stocks are, owing, as he supposes, to the different state of the sap: that of the apple being sweeter than that of the crab. A large quantity of seedling apples and crabs mixed, which were growing in his garden at the same time, were observed to be attacked by insects, more or less, as the kind approached the apple or the crab in its nature.

Soil.—There are few matters in Horticulture more difficult to describe than soils: much has been written, and we believe to little purpose, on this subject. The following sensible remarks of Mr. Rogers, sen., of the Southampton Nursery, and author of an excellent *Treatise on Fruit Trees*, appears to us to be so replete with good sense, that we will transcribe his article at length:—"The successful culture of the Apple depends very much on the suitableness of the ground they are planted in. The size and flavour of the fruit, the general health and duration of the trees, are most commonly the result of good or bad soil. Climate and situation both also affect trees and fruit; but not in the degree in which the same are affected by the qualities predominant in the land. Of all the different descriptions of soil to be met with in these kingdoms, that of a soft hazel loam, containing a small portion of sand, seems to be the most congenial to the Apple generally. In such soil, the tree is sure to flourish longest, is most productive, and remains most free from disease, or attacks of insects. A great depth is not requisite, eighteen or twenty inches being quite enough, provided it be on a dry sub-soil of chalk or loose rock. If the bottom be wet, the trees should be planted high, and every means taken to drain the ground. A wet bottom or gravelly clay should be avoided, if possible: no kind of Apples thriving long if the roots once enter into such a cold sub-stratum. Deep, rich soils, in sheltered situations, are not the most proper for the Apple, though such have been most erroneously recommended by writers who ought to have known better. For it is often seen, that Apple trees succeed well in any kind of loam, though it be not more than one foot in depth, so as the bottom is sound and dry: the roots take an extensive horizontal range, the young wood is always more moderate in growth, and better ripened, than where the roots strike deeper into the ground. Although local circumstances often control the wishes of the planter, compelling him to fix on a site where the soil may not be exactly like what is recommended above, he must, in this case, endeavour to bring the soil by trenching, draining, and by addition of the qualities wanting, as near to the standard as possible."

PLANTING.—The season of planting extends from the middle of November till the middle of February, and sometimes later. Autumnal planting is to be preferred in light sandy soils, and spring planting on soils of a strong and wet nature. Indeed, any time during the winter, the Apple may be planted with safety if neither frost nor snow should prevent the operation. Damp, but not rainy weather, should be preferred, particularly in dry soils; nothing is more injurious to any tree than to be taken up, even if immediately afterwards planted, during frosty or dry windy weather; not only do the roots, under such circumstances, sustain injury during the time they are exposed to the air, but the dry parching atmosphere, which must, in such cases, surround the whole surface of the tree, greatly exhausts it, while it is prevented from absorbing a fresh supply of food from the soil, in consequence of its roots being more or less shortened or diminished by the operation.

In regard to size or age, the Apple tree may be transplanted when only two or three years old from the graft, and also when it has attained a large size, and has produced fruit for years. We have known entire orchards planted with trees from ten to fifteen years' growth, which have succeeded as well as those planted with young trees direct from the nursery.

Deep planting is an evil much to be guarded against; and many of the disappointments which have attended the fruit grower, may be traced to this cause. As some criterion for the guidance of the amateur (few practical gardeners, we hope, require such), we would say, let every young fruit tree, of whatever kind, be planted at least three inches above the ground level; that is to say, let the part of the stem which was level with the surface while in the nursery be kept three inches above the general surface of the ground, when it is planted, and let the earth be heaped up to that height around it, for a couple of feet or so, in the form of a little hillock. Trees of larger size may be rather more elevated. This applies to soils of the ordinary description; but in damp soils the elevation should be still greater. When trees are set in the pit, which should always be a third larger in diameter than that of the extent of the roots, so that they may be all spread out to their full extent, without being doubled or turned round, they should be spread as regularly as possible, and the bottom should be made perfectly level; by this means, the roots will have a horizontal direction given to them, which they will afterwards maintain. The intention of this arrangement is to induce them to extend themselves near the surface, and to prevent their extending downwards into a bad or cold sub-soil.

Physiologists have argued, that in transplanting trees, the terminating points of the roots, or spongioles, should be scrupulously preserved, and attribute much importance to such preservation. The practical planter, on the other hand, holds this doctrine to be little better than ridiculous. No doubt, if we could transplant a tree with as little injury to its roots as we can transplant a geranium from one pot to another, there would be no doubt of the success of the operation; and such care would be no doubt required if we were to attempt to transplant an apple or a pear tree while in full vigour of growth, or loaded with its blossom or fruit. In this case, the preservation of the spongioles would be absolutely necessary, for then, indeed, they would be not only in existence, but in vigorous action. The physiologist, we suspect, had a plant or tree so situated in his mind's eye when he established his theory; and succeeding scientific writers, it would appear, have followed his example, without sufficiently studying the case in all its bearings.

The venerable Rogers, of Southampton, has attacked this theory, and we think has refuted it very completely. "In this," says he, "the man of science is at fault; because the practical man knows, that leaves on the head of a tree are produced at the same time as the fibres are on the roots; and, in many cases, both *fall* off together. The root fibres (or spongioles, if the learned will have it so) of the Apple, do not, indeed, all fall off, but certainly all become inert and torpid during winter. Besides, it is not altogether to the preservation of the last year's fibres that the planter looks for success; nor can the transplanted tree be much benefitted by saving those organs which have already done their duty. Both the one and the other must rely on the *new* vigorous fibres which *will be produced* in the new station; and if a removed tree be planted in soil which is fine, moist, and warm enough, no fears need be entertained, but that new fibres will quickly come forth to carry on the growth of the plant. In transplanting a tree, however, there is no necessity for uselessly exposing the roots to the sun and drying air: this might enfeeble the *main roots*, which would be of worse consequence to the plant than the mere loss of the spongioles, a majority of which would certainly have died, even if the tree had been allowed to stand in its former place."

With respect to the doctrine of spongioles, we will only add, that thousands, nay, millions of trees are planted annually, whose roots, from one cause or other, are as completely destitute of these organs at the time of planting, as their branches are of flowers or fruits. Besides, we entertain an idea, that will be noticed elsewhere, that the roots of fruit-bearing trees require a sort of pruning, if not annually, at least once in every five or six years, by which process we propose to shorten the roots in such a manner as to leave few of them at a greater distance than three or four feet from the stem.

PRUNING.—To render the following brief observations as intelligible as possible, we must consider this subject under the following heads, viz.,—Standard trees, dwarf standards, espaliers, and untrained trees. It must also be observed, that Apple trees bear upon small terminal or lateral spurs, which spring from the branches of two or more years' growth, and not upon the young wood of the preceding season, as in the case of peaches and nectarines.

The late Mr. Salisbury has very judiciously remarked, that "pruning trees is a subject respecting which every gardener pretends to have a competent knowledge, and those who have written on the subject have endeavoured to lay down rules for the operation; but I confess," he says, "that although I have had considerable experience for many years, and I know the theory on which rules for it may be formed, yet I am incapable of communicating my ideas on the subject, as it wholly depends on the state of the trees; and it would be as absurd for me to tell any one what branches he should cut out, and what leave, by description, as it would be for a physician to prescribe for a patient who labours under a severe and acute disease, on the mere report of the nurse, without a personal inspection of his patient. I must be pardoned, therefore, if I say, that nothing but experience, founded on long observation, as to the growth of trees, will ever enable a person to discover the proper art of pruning.

"One observation should be attended to, which is founded on facts; that is to say, although it is certain that nature is, in every case, sufficiently bountiful in all her works, we do not find any exuberance; and in any assistance which we endeavour to give her in this way, we should keep in mind, that every branch in a fruit tree more than is wanted is a great waste of nature's purest material, employed in the formation of fruit and wood; and, therefore, if the branch is skilfully taken away, the sap will be sure of being employed to some other good purpose; for every useless branch, like every noxious weed, should be put out of existence."

PRUNING STANDARDS.—Few departments in Pomology are more neglected than that of pruning standard fruit trees, and in no part of Britain is this less attended to than in the cider countries, where so much depends on the productiveness of the orchards.

The great principle to be attended to in pruning standard Apples, is cutting out all dead, diseased, or useless branches at their base, and thinning those that are healthy and vigorous, so that the sun and air may penetrate to every part of the tree. Few people have confidence enough to do this effectually; but they may be assured that they would have more and better fruit, were they to retain only one-third of the number of branches which in general at present exist in most orchards.

Standard-trained trees are often allowed to grow into great confusion for want of pruning, and, consequently, the tree becomes, in course of time, exhausted from producing a superfluous number of boughs, twigs, and leaves, and finally becomes barren and unhealthy. To remedy this most completely, the main branches should be headed down or shortened to within from a few inches to a foot or two of the trunk. This operation should be carried into effect in February or March, and the consequence will be, that a complete new head of healthy and fruitful branches will be produced. It seems that the roots of trees grafted upon crab or on free stocks are much more durable than the heads, a circumstance known to the great Lord Bacon, and practically illustrated by the late Forsyth, in the Royal Gardens at Kensington. Trees requiring to be headed down may, with great advantage, be grafted with other more approved sorts, and these grafts will, in most cases, produce fruit the third or fourth year afterwards.

PRUNING AND TRAINING DWARF STANDARDS.—Dwarf Standard-trees are usually planted in select orchards, where cattle are not permitted to enter, and also in kitchen gardens, by the sides of walks, or in lines through the quarters. The latter mode is in many ways objectionable. Apples to be cultivated in this way, should be of the more select sorts, which are in general slender growers, and they should be worked upon Paradise stocks, which greatly checks over-vigorous growth. Dwarf Apples are trained in a variety of ways, but we prefer the open standard form, which should not be allowed to exceed the height of eight or nine feet, be kept moderately thin of branches, and perfectly open in the heart, and pruned nearly upon the principle of gooseberries and currants; that is, by annually shortening the leading shoots when they require it, leaving only from six to eight inches of the young wood, and occasionally, when a leader is exceeding due bounds, cutting it back to some point towards the stem, to the place whence an eligible young shoot has sprung, and which is to be chosen for the future leader. No doubt, a good deal may be done both in forming the tree and in inducing fruitfulness by the art of pruning; but this is an art which, to be completely understood, must be studied practically on the tree; for, as no two trees are exactly alike in all circumstances, so no universal mode of pruning or training can be alike beneficial to all.

There are some kinds of apples that are much better calculated for this mode of training than others, and, indeed, require scarcely any training whatever: of these, the Hawthornden, Nonsuch, Ribston Pippin, Keswick Codling, Scarlet Nonpareil, all excellent apples in their way, may be given as examples. It were much better for the cultivator to form a selection of such, than to attempt, by the aid of pruning or training, to reduce to his will sorts of coarser and more robust habits.

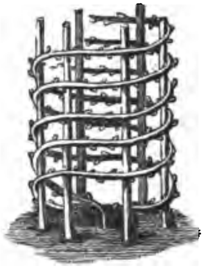
This mode of cultivating the Apple is carried to a very great extent in the islands of Guernsey and Jersey, both celebrated localities for fruit of all kinds. These trees are grafted on Paradise stocks, are kept dwarf, and comparatively close together; they produce abundantly in three years, when not more than four or five feet in height, and about the same in diameter through the branches. In such cases, the ground is very properly given up entirely for this purpose, the trees being planted ten feet apart, and five feet distant in the rows. It has been proved, that a quarter of an acre planted in this way will contain two hundred and forty trees, the area of the surfaces of which, taken collectively, amounts to nearly as much as the whole ground.

Mr. Rivers, the respectable nurseryman of Sawbridgeworth, has long cultivated a selection of Apples in a miniature orchard, and describes his mode in the *Gard. Mag.*, vol. iii. p. 282, in the following words:—"By planting the proper sorts, apples may be grown in as small a space of ground as gooseberries; and a large or small square, according to the size of families, appropriated to apples, will grow every year enough to supply their wants." The trees are planted at six feet distance each way, in quincunx order. "This plan," he observes, "will not extend to the strong-growing sorts, as they are not easily kept within bounds; but the following six will amply repay the trouble and trifling expense of planting." They are here placed in the order of their ripening:—"Manks Codlin, Hawthornden, Kerry Pippin, Downton Pippin, Christie's Pippin, and the old Golden Pippin; to which may be added Coe's Golden Drop, a most excellent late table apple. The trees must be chosen with stems not exceeding one foot six inches. In September," he "generally looks over the trees, takes off superfluous wood, and shortens the long shoots: this strengthens the bloom buds, which are formed abundantly upon the young wood of all the sorts named: of course, in doing this, an eye must be had to the formation of the tree, which ought to be gradually brought into a handsome round bush. For the first five years, a row of strawberries may be grown between each row of apples, or any other dwarf light crop; but strawberries are most in keeping,—a word which, in every gardening operation, ought never to be lost sight of. Let me add," he continues, "they ought to be worked on Paradise stocks, or the small wild crab, not by any means on the free stock raised from apple pips, the very worst stock that can be used."

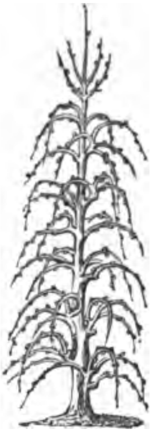
The following is a list of fifty sorts of apples so managed in the Claremont gardens, none of which exceeds eight feet in height, and five feet diameter through the branch: they have been planted seven years, at fifteen feet apart, and follow in a continuous line. They have not all succeeded alike, and for that reason we are induced to give them as an example, marking those (*) which have succeeded the best.

Ribston Pippin
Fall Pippin
Northern Greening
*Kirke's Golden Pippin
Grange Apple
*Sugarloaf Pippin
*Red Ingestrie
*Golden Pippin
*Dutch Codlin
*Beauty of Kent
*Wyken Pippin
*Fearn's Pippin
*Beauty of Wilts
*Wormsley Pippin
*Powell's Russet
*Pile's Russet
*Old Nonpareil
*Duchess of Oldenburgh
*Sykehouse Russet
Newtown Pippin
*Hawthornden
*Croften
Kentish Codlin
*Robinson's Pippin
*Cockle Pippin
Kirke's Lord Nelson
Emperor Alexander
*Golden Noble
*Manks Codlin
Winter Pearmain
Court pendu plat
*Golden Harvey
*Kerry Pippin
Kirk's Scarlet Admirable
Norfolk Beaufin
*Braddick's Nonpareil
Gravenstien
*Kirke's Golden Reinette
*Hick's Fancy
*Skinless Early Russet
*Margil
*Court of Wick Pippin
*Sykehouse Russet
*Yellow Ingestrie
Maddock
*Cobham Apple
*King of the Pippins
*Nonsuch
*Gloria Mundi
*Kirke's Scarlet Nonpareil

The French mode of training dwarfs, upon the principle of what is called hoop-training, is accomplished by forming a circle of stakes, about three feet in diameter, and four or five feet in height, round the tree, to which the branches are trained in a spiral manner. Another mode, much in use on the Continent, and called the *en quenouille*, or distaff form (No. 1, *infra*), has been highly recommended by writers in this country, and exemplified to a considerable extent in the gardens of the London Horticultural Society; but its success has not been sufficient to induce us to prefer it to the open dwarf standard form, noticed above. Indeed, our attention was particularly directed to this method of training in several journeys through the North of France and the Netherlands, where it is very generally adopted, but we have rarely observed that trees so trained were so productive as those grown in a more natural form. In training in the distaff form the main stem is allowed to extend as



nearly perpendicular as possible: the lower lateral branches which proceed from it are trained in a drooping position, by having for the first season their ends bent round and tied to the main stem; the next set of branches above them are rather shorter, and hang over them, and so on to the top, where the form terminates almost into a point. This mode, as well as that termed *en pyramide* by the French (No. 2.), is much used in training the pear.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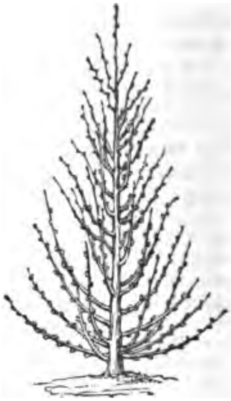

No. 2.

Pruning and Training Espaliers. — The idea of pruning and training the Apple in the espalier manner originated with the French, and was introduced into this country at the period when French gardening was in fashion. Of late years this mode of training has been rather on the decline. It has however, certain advantages, which claim our attention. Espaliers may be considered as intermediate between trees trained as standards or planted against walls. They occupy less space than standards of whatever form, and therefore are desirable in small gardens. In larger ones they form an agreeable and useful screen to hide the crops of culinary vegetables from being seen from the walks, and to a certain extent they break the force of the winds in exposed situations.

The following Apples have been recommended for training against espaliers:—Alfriston, Brabant Bellefleur, Bedfordshire Foundling, Beachamwell, Carlisle Codling, Court of Wick, Court-pendu plat, Franklin's

Golden Pippin, Golden Reinette, Hughes's Golden Pippin, King of the Pippins, Oslin, Royal Codlin, Royal Pearmain, Royal Russet, Reinette de Canada, Syke House Russet. To which we may add the Hawthornden, Nonsuch, Ribston Pippin, &c.

The distance apart at which espaliers should be planted depends on the nature of the soil and the kinds chosen, whether they be strong or weak growers, and the sorts of stocks they are grafted on. Apples wrought on crab stocks require from twenty to thirty feet distance, but we should prefer them on Paradise stocks, particularly for small gardens: from fifteen to twenty feet will be sufficient.

Espalier rails are sometimes formed of cast iron, and do not differ much in general appearance from common street railings; but the most economical rail is that formed by driving stakes into the ground about a foot or eighteen inches apart, and four or five feet in height, to which the branches of the tree are fastened. These stakes are usually obtained in the process of thinning young plantations, and should be either of larch, acacia, or Spanish chestnut, which are our most durable woods, while young. The bark is removed from them, and when placed in their proper position they are fastened together by a thin slip of wood or iron hoop along their tops, which keeps each in its proper place.

The trees most proper for this purpose are one year old from the graft, having, if possible, three shoots, one in the centre for a stem, and one on each side to be laid into the espalier rails horizontally, which is the only mode of training that can be very advantageously employed.

Young trees of one shoot may be planted and allowed to remain without pruning for the first year, that their roots may become well established; but in the following spring they should be headed down to within eight or nine inches of the ground, when they will in most cases send out three shoots. The second season of pruning, the two side shoots should be laid into the rails in a horizontal position, about ten inches from the ground, and the middle or leading shoot should then be cut to about twelve inches in length. The third season for pruning, the centre shoot should be again shortened to ten, twelve, or fifteen inches in length, according to its strength and sort of apple, and the two side shoots laid into the rails. This routine is followed year after year, until the tree has filled its alloted space. Unless in case of accident, the horizontal branches are to be kept at their full length.

Gardening authors have variously esteemed the value of espaliers; M'Phail disapproves of them. Nicol observes, "Espaliers, if well managed, are both ornamental and useful in the garden, affording a deal of fruit, yet taking up little room." Forsyth offers no opinion, while Marshall recommended the best kinds of fruit to be planted in this manner. Dr. Neill and Abercrombie are favourable to them: the former observes, "Of late years some have purposed to banish espalier trees altogether, alleging that they injure the kitchen garden compartments, by depriving them of sun and air. But, in point of fact, they exist in the greater number of kitchen gardens, and are not likely soon to be laid aside. If they are sometimes injurious, by depriving the plants of air, they are at other times very useful, acting as a hedge in protecting the young crops from the violence of strong winds. Espalier trees generally produce excellent fruit, the sun and air having access to both sides of the tree: they commonly afford abundant crops, and the fruit is not apt to be shaken by high winds. Further, they tend to hide the crops of culinary vegetables from the eye, and to render the walks of the kitchen garden as pleasant as an avenue in the shrubbery."

"Besides the value of their fruit," Mr. Loudon observes, "they form a sort of counterpart to the trees on the walls, and add much to the general effect of the garden, by increasing the appearance of design, and much to its beauty in detail by the variety of their blossoms in spring, and their fruit in autumn."

This mode of training the Apple appears to have been much more common in this country formerly than at present. Rogers informs us, that "the celebrated Sir William Temple had extensive espalier grounds at Sheen, near Richmond, Surrey. The trees were planted in parallel ranks, running east and west, many of them on English stocks, and they uniformly produced abundant crops for the space of eighty years." And also that Mr. Secretary Johnston, at Twickenham, most successfully cultivated both apples and pears in this manner, and to a very considerable extent. Our own opinion is, that fruit trees might be much more extensively cultivated in this way than they are at present.

Pruning and Training the Apple Tree against Walls.—Some of the more choice varieties of Apples are cultivated against walls, and the superior size, flavour, and colour which they thus attain justifies the practice. In Scotland this practice is common, and in cold, late situations in England, where the vine and the fig do not ripen well, and where the peach and nectarine become diseased or short-lived, we should think it better to cover such walls with Ribston and Golden Pippins, and similar good apples, than to occupy them with fruits that do not produce a certain return.

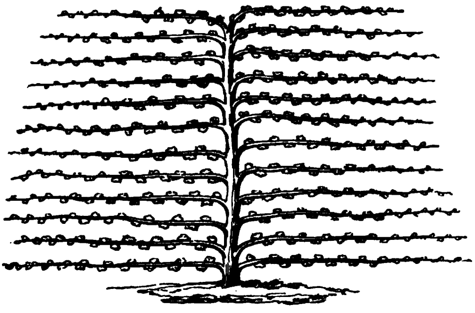
The following Apples have been recommended for wall culture:—

[Those marked * are considered the best.]

Bedfordshire Foundling for a North-east aspect
* Brabant Bellefleur, ditto
Court of Wick, S., S.E., E., or W.
* Cornish Gillyflower, S.E., or S.W.
* Court-pendu, E. or W.
* Golden Pippin, S., S.E., or S.W.
* Golden Harvey, E. or W.
Newtown Pippin, S.E. or S.W.
* Nonpareil, S., S.E., or S.W.
Oslin, E. or W.
* Ribston Pippin, E. or W.
Reinette de Canada, S.E. or S. W.
Scarlet Nonpareil, S., S.E., or S.W.
* Syke House Russet, E. or W.

South aspects may, to the south of York, be too great a sacrifice of wall to occupy with apples, if we except the Newtown Pippin and other esteemed American sorts, but in more northern latitudes there can be no doubt of the wisdom of this arrangement. East and west aspects are in general used for this purpose, and even in north aspects excellent Apples are found to be produced.

For training the Apple as a wall tree, the horizontal method is in general preferred, as it has a greater tendency to moderate the circulation of the sap. Hit, and afterwards Mearns, have recommended training the main or upright stem in a serpentine or zig-zag manner, while Harrison, with perhaps better physiological reasoning, recommends the more simple mode of training it upright, and cutting down the current year's shoots in June, by which he gains annually two series of horizontal or side branches, one from the June pruning and the other from the spring or winter pruning. This latter method is not very generally adopted, but deserves the at-



tention of the Pomologist who cultivates the Apple either as a wall or espalier tree.

It would perhaps be superfluous were we to enter into the details of pruning, spurring, and training the Apple as a wall tree here, as much of what we shall have to say of the pear is applicable to the Apple also. We would, however, recommend every gardener to consult Harrison's treatise, which contains many excellent and rational practical directions on the subject. Apples of the more delicate and weak-growing kinds may be with propriety trained on the fan principle, and, by so doing, a succession of young wood will be more readily obtained than in the case of horizontal training, and this young wood will be found to produce, at the proper age, natural flower buds, which must always be considered more desirable than artificial ones produced by annually shortening the breast or young lateral shoots. Indeed, our opinion is, that no encouragement should be given to the production of the latter, as they in course of time project too far from the wall, become unsightly, and if encouraged prevent the more natural formation of the former.

INSECTS INJURIOUS TO THE APPLE.—The most destructive of all insect enemies to the Apple is the American blight (*Eriosoma lanigera* or *Aphis lanigera*). This insect is said to have been imported upon Apple trees brought from America, and to have first made its appearance in a nursery in Sloane Street, in 1787, but Salisbury asserts, upon what he supposes to be good authority, that it was introduced by the refugees from France, in the reign of Louis XIV., and first made its appearance at Paddington, where some of these people settled. It has now extended itself into every part of Great Britain, and few gardens or orchards are without it. The late Sir Joseph Banks studied the origin and history of this insect, and came to the conclusion that its extirpation was to be effected by the application of spirits of tar laid over the parts affected. This remedy, if early begun and persevered in, will no doubt eradicate it

in time, or at least greatly lessen its effects: but the most effectual of all remedies is to obtain, if possible, trees completely clear of it in planting a new fruit garden or orchard, which, by the bye, is no very easy matter, as most nursery stocks are more or less infected with it. For this purpose the trees should be selected during summer, when the disease is most conspicuous. This precaution, with a watchful eye kept upon the trees ever after, is the most effectual remedy.

In gardens where it already exists, the next most rational plan of operation is, pruning away during winter all infected shoots and branches, and even taking up the tree and performing the same operation on the roots when it also abounds, removing decayed bark, and the blisters or protuberances which it occasions, with a sharp knife, washing the parts affected with the strongest ardent spirits possible, and keeping up a perpetual war against those that appear during summer, by bruising them with a hard brush of a long narrow form, capable of being applied between the branches, and into every cleft and corner, where they chiefly take shelter. This insect is also sometimes attacked by covering the trees during winter with a thick lime wash, or more simply with a strong clay wash, made so thick that when dry it will form a coating or plaster over every part of the tree. Both these plans at first sight appear reasonable, because the insects supposed to be under them would become suffocated for want of air; but the misfortune is, that they are not in a state of existence during winter, but only their eggs; and thus, instead of being destroyed, either by the lime or clay covering, they are really protected by them till the warmth of spring brings them into existence, at which period also these coverings are removed by the action of the vernal showers, and the young aphides, thus liberated, commence their attacks upon the tree.

Salisbury, who has described this insect pretty accurately, and given figures of it in various states, believes it to be a native of a warmer climate than ours, from the circumstance that the living insects as well as the eggs remaining on the branches of the trees are frequently killed by the action of frost, which was the case, he says, in the winter of 1813-14: may we not, then, reasonably expect that the last severe winter, 1837-8, has lessened their numbers from a like cause. It unfortunately, however, happens, that the roots of the trees are also attacked by them, and from thence a yearly stock proceeds as the warmth of spring advances, for it has been found that both eggs and insects remain under ground in safety.

"The practice of ablaqueation," that is, laying the roots bare, appears to the above authority to be the mode "most likely to get the better of the evil occasioned by this insect;" he therefore recommends, "that the roots of trees affected be laid bare in the winter season, well washed, and left to the action of the frost, and the application of such things as urine, night soil, hog's dung, &c., laid round them in a moist state."

All washes, compositions, and powderings are only very slight impediments to the progress of so destructive an enemy. The mechanical operation of brushing, and reducing by pruning, is the best. Whatever remedy be resorted to, it should be put into operation during the season when the insect itself is in existence, for to attempt to destroy it in the egg state is impossible without injury to the tree.

The other insect enemies of the apple are the caterpillars of several species of moths, which attack the leaves while yet in a very tender state, which they feed upon, and cause to curl and fall off. Watering the trees with the garden engine, and while they are wet dusting them over with fine powdered caustic lime, has been found sufficient to destroy them. There are several caterpillers which attack the foliage when full grown, such as the *Bombyx cœruleo-cephala*, Figure-of-eight moth; but these rarely do much injury unless the trees grow in shaded situations, or near hedges. The most rational mode of cure in such cases is burning haulm or straw, slightly sprinkled with sulphur, to windward of the infected trees. The Norman orchardists fumigate their orchards in autumn by this means, which they say prevents the parent insect from depositing its eggs. For this method to possess the efficacy that they attribute to it, the operation should be performed just before, or at, the period when the insects lay their eggs. To do it long before or afterwards would be of little avail.

THE DISEASES TO WHICH THE APPLE IS LIABLE.—The canker is the principal, and we may say the only disease to which the Apple is liable, at least to any great extent. This disease originates from more causes than one. It may be occasioned by wounding the tree; and injudicious pruning, by leaving the wounds rough and liable to the lodgement of humidity, will also cause it to appear. But the principal cause of canker must be attributed to a constitutional disease, and to arise from a defect in the organization, occasioned by some impure quality in the subsoil. "This is a conclusion," says Rogers of Southampton, "come to from experience, because, in low, damp situations, where the subsoil is strong gravelly clay, there the trees are mostly cankered; while the same kinds planted on a light loam, having a dry bottom of rock or chalk, remain perfectly free from the disease. We cannot exactly say how this happens, or describe what the deleterious qualities are which derange and destroy the healthy bark and wood of a tree; but, knowing what is stated as the cause to be a fact, all we can do to prevent it is, to avoid placing trees in situations where they would be liable and exposed to the disease; or if our land be of that unfavourable kind, endeavour to improve it by draining, or by any other means that will prevent the roots from sinking into a noxious subsoil." This theory is, however, different from that laid down by Forsyth, who says that it always proceeds from the branches and stem to the roots, and never from the roots to the tree.

Planting high and in wet soils, even almost on the surface, inducing the roots to take a horizontal direction near the sun and air, and using all means to prevent their extending perpendicularly downwards, is the best means for preventing this disease. Flagstones, tiles, bricks, and composition floors are all found necessary to be placed under fruit-tree borders where the finest fruits are to be grown, and these precautions should be taken as far as our means will admit of, even in planting the most common orchard varieties.

THINNING THE FRUIT ON APPLE TREES.—Few gardeners, we believe, will dispute the necessity of thinning the fruit on their peach and apricot trees, which they admit improves those that are left to come to maturity, but few, we will venture to say, if ever they even thought of it, have carried the thinning of their apples and pears to any useful extent. This is a branch of culture too much neglected. We all know that a tree will ripen and mature ten dozen of fruit much better than it can twice or thrice that number, and with much less exertion on its own part; and also that the fruit will not only be larger, better flavoured, and in every way superior, but that the tree will be placed in a condition to produce a fair crop annually for many successive years: whereas, by the usual way of allowing the tree to produce as many as will remain on it till they become ripe, it is deprived of that share of nourishment which Nature has designed to go to the formation of fruit buds for the succeeding crop, and hence it is that we so frequently see a tree, or even a whole orchard, loaded with fruit one year, and the following bearing scarcely any at all. The proper season for thinning apples is just when the fruit is beginning to swell, and at this very period we see Nature doing what we ought to do for her, for at this time the trees generally, when overloaded, shed a great portion of their fruit, as if they were conscious of their inability to bring it all to perfection. In thinning Apples, as well as other fruits, those should be removed that grow in shaded parts, or towards the middle of the tree, leaving the outside ones as enjoying the greatest portion of light and sun: not more than one fruit should be left on a spur, and indeed, if the fruit be from nine to twelve inches apart, the crop will be quite abundant enough. The choicer kinds of course demand attention in this respect; the more common, so long as they do not injure the trees, may be left to their fate.

GATHERING AND PRESERVING APPLES.—"All summer fruits," says Rogers, "should be gathered in the cool of the morning. They are then more juicy and high-flavoured. If gathered in the heat of the day, they are vapid, and not half so refreshing to the palate as when gathered before the sun has much power." But in regard to gathering the more valuable and winter fruits the case is wholly different. We should, however, premise, that it is important that keeping apples should be as completely ripened as the climate and season will admit of, as, if they be gathered before they are ripe, they shrivel, and do not keep so well.

We believe modern experience will bear us out in this assertion, and even were the opinion of the olden times required, we could perhaps quote no stronger, although quaint authority, than that of Tusser, who in his Five Hundred Points of Good Husbandry, says,—

> "Fruit gathered too timelie, will taste of the wood,
> Will shrink and be bitter, and seldome proue good:
> So fruit that is shaken, or beat off a tree,
> With brusing in falling, soon faultie will be."

and further,—

> "The moon in the wane, gather fruit for to last,
> But winter fruit gather when Michel is past."

The ripeness of Apples is determined by lifting up the fruit level with the foot stalk: if ripe it will part readily from the tree. Another mode is to cut open a fruit of average ripeness: if the seeds have become brown or blackish they may be gathered with safety.

A dry day is to be chosen for gathering keeping apples, and even then the middle of the day should be preferred, when the foliage and fruit are perfectly dry. They should be picked individually and by the hand, and the best selected with the greatest care, carried to the fruit-room, and placed on shelves, each kind kept by itself. The small and inferior fruit should also be carefully picked, and placed in the fruit-room also; or they may be packed in hampers or boxes between layers of very dry fern, as this will not communicate a disagreeable smell or taste, which hay or straw is sure to do. These hampers or boxes may be deposited in a dry cellar, loft, or out-building, where the temperature is as uniform as possible. The finer samples of the best varieties of table apples should be laid on the shelves upon sheets of clean white paper, such as is used for printing, and not more than one course in thickness, and the whole should be covered over with a thin linen cloth to keep the dust from them.

The late keeping sorts of kitchen apples, if there be space in the fruit-room, should be also laid on shelves, but these may be put closer together, that is, two or three rows thick. For the generality of kitchen apples we have found the most convenient plan to be (where there is a very large quantity), to pit them in the ground, as is usually done with potatoes. A dry spot of ground should be selected, which should be made perfectly level, but not sunk under the surface; on this the apples should be laid in a heap of a ridge-shape, about three feet in breadth at the bottom and terminating in a point at top. Each sort of apple may be kept separate by placing a thin layer of dry fern between them. Proceed in this manner until the whole are disposed of. As each kind is so placed, put a lath or similar piece of wood at the end of each kind, so that its top may appear above the mould with which the whole is to be covered. On this label write the name of the sort of apple, as a guide to the part of the heap where it is placed. When the fruit is so arranged, cover them over to the thickness of nine or twelve inches with dry fern, and over that a foot or fifteen inches of mould, finishing the whole in a ridge-shaped form, and smooth the surface to enable the wet to run off. By this mode we have several kinds of apples at this time (the 5th of August) in as great perfection as when they are gathered from the tree.

It ought to be observed, however, that apples kept in this way soon decay when brought into the open air, and it is to obviate this that we recommend keeping each kind separate, and labelling them as above: we are thus enabled to open the side of the heap at the part opposite any particular kind which we want, in the order in which they stand as to keeping, and thus one sort may be taken out for use without any of the others being disturbed or affected by the air.

Some of our finer table apples we have placed in large flower pots, and buried them three and four feet deep in the ground, placing a large tile or slate over the mouth of the pot to prevent them acquiring a disagreeable flavour from the mould. From the experiments made in the fruit-room of the London Horticultural Society, it has been found that apples keep best when packed in dried fern and placed in a dry shed or cellar, where very little change of temperature takes place.

F334

HARVA
LI

JAMES
Charles Eliot P

To be kept

As we shall have to treat more at length upon the subject of keeping fruits when we come to the Pear, we beg to refer the reader to that part of this work for further detail on this important subject.

THE APRICOT.

Columella is the oldest Roman author who has mentioned the tree that has been supposed to have been the Apricot, and after him Pliny and Dioscorides. The latter describes it as known in Italy under the name of Præcocia; and the former particularly mentions it as the Apricot, and states that it was introduced into that country about the sixteenth year of the Christian era; but although he mentions two sorts of it, he does not inform us whence it came. Theophrastus, one of the oldest Grecian authors, alludes to its being an exotic, of which he had an account transmitted to him, which would warrant the conclusion that it was not cultivated in Greece in his time.

Thunberg describes it as abounding in Japan, and attaining the size of a large-spreading tree. Grossier informs us that the Chinese have many varieties of it, which they cultivate both for ornament and use: the double-blossoming varieties they often plant on mounds, and the dwarf ones planted in pots they admit into their chambers. The barren mountains to the west of Pekin are described by the same author as being covered with these trees. To this locality we may almost infer that they are indigenous; but that they exist in a state of nature elsewhere is also certain. From the trivial name Armeniaca many have conjectured it to be a native of Armenia; but Regnier and Sickler assign it a parallel between the Niger and the Atlas: Professor Pallas distinctly states it to be a native of almost the whole range of the Caucasus, these mountains being covered with it from bottom to top.

M. L. Legnier, in *La Revue Encyclopedique* for 1815, says, "I was struck with its mode of growth in Egypt, where it was anciently brought from latitudes still further southward, and that the inhabitants of the deserts called Oasis gather and dry large quantites of apricots, which they bring down to Egypt for sale." The result of every inquiry made by that author was, "that the apricot tree grows there spontaneously, almost without cultivation; and as it is not known to grow in a natural state in any part of Armenia, we may very justly conclude that it is an Arabian fruit."

The derivation and orthography of the name have also given rise to much speculation. Some have thought it derived from *Apricus*, "open and exposed to the sun;" or, according to other, from *præcox*, "early ripe." Professor Martin observes, a tree when first introduced might be called a *præcox*, or early fruit; and gardeners, taking the article *a* for the first syllable of the word, might easily have corrupted it to *aprecocks*, *aprecok*, as Dr. Turner writes it, and Gerarde, still latter, *abrecoke*, *aprecock;* Justice, in 1764, *apricock*, and finally *apricot*, in 1782, by Kyle, of Moredun. Phillips, in the *Pomarium Britannicum*, says, "There can be no doubt that the words are a corruption of the Arabic name of the fruit, variously written in European characters, *barkut*, *berkach*, or *berikach*.

Turner, in his Herbal, records the Apricot as cultivated in England, in 1562, and Hakluyt, in his "Remembrancer," 1582, states that it was introduced from Italy by Wolfe, who acted as priest and gardener to Henry VIII.; and the same date is given in "Gough's British Toporaphy," vol. i. p. 133.

The medicinal properties and use of the fruit are as follows:—The green fruit, when gathered to thin the crop, makes excellent tarts, and when ripe is much esteemed for making marmalades, jellies, and preserves. The fruit when not over-ripe is slightly astringent, and strengthens the stomach, but when it has passed that state it becomes clammy, less aromatic, and less easy of digestion.

The celebrated Madame de Genlis, with her usual vivacity, relates the following little anecdote, which may not be altogether out of place here; but any attempt at translation would evidently destroy the wit, which depends on the similarity of the French name for apricot tree with the inscription alluded to.

"Après la mort de Louis XI., au commencement de la régence de Madame de Beaujeu, plusieurs personnes furent disgraciées; entre autres, Cotier, premier médecin du feu roi, qui, s'applaudissant d'être échappé de cette cour orageuse, fit sculpter sur la porte de sa maison un abricotier avec cette inscription, 'A l'abri Cotier.'"

VARIETIES.—Gerarde, in 1597, mentions two varieties as growing in his garden, and Coles, in 1657, says, "I am not assured that there are more than two sorts of Apricot trees," although Parkinson, in 1629, enumerates six; Ray, in 1720, seven: Langley describes four; Forsyth, in 1806, describes ten sorts, and afterwards enumerates thirteen others, many of which are only synonymes of the former. Nicol describes six; G. Lindley, in 1831, fourteen; the Ency. of Gard., eight; Rogers, in 1834, eight; Neill, six, and the Fruit Catalogue of the London Hort. Soc., enumerates a much greater number of names, from which Mr. Thompson, the intelligent curator of the fruit department, has selected and arranged seventeen in groups (*see page* 76), as being distinct and worth cultivation.

SELECT LIST OF APRICOTS.

1. **Breda.** [*Syn.*, Royal Persian, Abricot de Hollande, Amande Aveline, Anannas.] —Originated in Africa, according to Forsyth, and probably introduced from Breda, in Holland, which accounts for the name. Size, rather small; form, roundish, but approaching to be a little four-sided; colour, deep brownish orange, and dotted with brown spots on the sunny side; flesh, deep orange, separating very freely from the stone; flavour, excellent; stone, roundish, small, and flattened; kernel, pleasantly sweet (which is its principal mark of distinction from the Brussels), resembling the flavour of a hazel-nut, and hence the French call it Amande Aveline; ripens on walls in August, and on standards towards the end of that month, or beginning of September; habit, healthy grower, and good bearer, in favourable seasons. "The wood, leaves, and buds are very like those of the Moorpark, which is only" according to Rogers, "an improved variety of the Breda:" he observes, p. 140, "the improved kind was originally planted in the garden of that celebrated place while occupied by a Lord Dunsmore," as he incorrectly writes it for Dunmore; and hence obtained the name of Moorpark. With every respect for Mr. Rogers's great knowledge of fruits, we think he has mistaken the true Breda for Dunmore's Breda, one of the synonymes of the Moorpark. There is another Breda mentioned by Miller, which is probably the same with which Rogers has been acquainted. The best stock for the Breda is the muscle plum.

2. Brussels.—Originated, most probably, at or near Brussels, and introduced here about one hundred and fifty years ago. Size, medium; form, somewhat oval, a good deal flattened on its sides; colour, pale yellow in the shade, with many white specks, red on the side next the sun, and marked with many dark spots; flesh, yellow and firm, separating freely from the stone; suture, deep at the base, shallow towards the eye; flavour, high, when not too ripe; stone, small; kernel, bitter, which sufficiently distinguishes it from the last; ripens on walls about the middle of August, but on standards a fortnight later; habit, healthy, and a good bearer. One of the best Apricots to be grown as standards. The best stock for the Brussels is the muscle plum for dwarfs, and the Brussels stock for standards.
3. Hemskirke.—Introduced by the late Mr. Lee, of the Hammersmith nursery. Size, medium; form, round, slightly flattened; colour, orange; flesh, firm, very bright, clear, deep orange; flavour, particularly rich and delicate; stone, small, and without a pervious passage; kernel, nearly sweet; ripens, about the end of July and beginning of August; habit, much resembling the Moorpark, but much more healthy, and an excellent bearer. The best stock for dwarfs is the muscle plum, and the common Apricot for standards. "The flowers being large," it is observed by Rogers, "are more tender than the smaller-flowering varieties; and, consequently, require more care in defending them from frost."
4. Large Early. [*Syn.*, Abricot gros d'Alexandre, Abricot gros précoce, Abricot de St. Jean, (from its ripening on Midsummer Day,) Abricot de St. Jean rouge.] Originated evidently in France, or probably in Egypt. Size, above the medium; form, somewhat oblong, flattened; colour, bright orange, with deep spots of red on the side next the sun, pale orange on the shaded side; skin, downy; flesh, orange-coloured, parting freely from the stone; suture, deep; stone, very flat, oval, brown, sharp at the point, and perforated along the back from one end to the other; kernel, bitter. This is the earliest of all the large Apricots.
5. Moorpark. [*Syn.*, Anson's, Dunmore's, Dunmore's Breda, Temple's, Imperial Anson's, Peach, Abricot-peche, Abricot de Nancey.]—Said to have been introduced from the Netherlands, by Sir Thomas More, in 1700, also by Sir William Temple, and planted in his garden at Moorpark, in Hertfordshire, before that date, as Sir William died in 1700, aged seventy-two; and if we are to admit the Peach-Apricot to be the same as Mr. Thomson supposes,—and we think there is good reason for it,—then it was also introduced a third time under the latter name, by his Grace the Duke of Northumberland, in 1767. Size, the largest of all Apricots; colour, pale yellow on the shaded side, and deep orange, marbled with brownish red, next to the sun; form, round; suture, well defined, as one of the sides is more prominent than the other, which gives the fruit a slightly oblique appearance of form; flesh, firm, deep orange, separating freely from the stone; stone, rather rugged, with a pervious passage; kernel, bitter; habit, strong and healthy, in soils and situations suitable to it, but, unfortunately, these appear to be few. The proper stock for the Moorpark, Rogers says, is the muscle plum for dwarfs, and the Brussels for riders or standards. We have noticed elsewhere that the late Mr. Knight entertained an idea that it might be wrought upon stocks of its own kind with advantage. Ripens the end of August and beginning of September. This is the best of all Apricots, and probably

we may be justified in saying that scarcely any other sort is worth growing where this one will succeed.

6. Orange. [*Syn.*, Royal George, Royal Orange, Early Orange, D'Orange.]—Introduced before the time of Queen Anne, as it is mentioned by London and Wise. Size, larger than the Masculine, and much larger than the Small orange, which is an inferior fruit, and hence the present has been called Royal, to distinguish them apart; form, nearly round; colour, pale orange on the shaded side, deep orange, tinged with red, on the side next the sun; flesh, deep orange, and firm, adhering to the stone; suture, deep at the base, one of the sides swelling much more than the other; flavour, excellent; stone, small, nearly smooth, thick in the middle; kernel, sweet; ripens the beginning and middle of August; habit, healthy, and when budded on the muscle stock a vigorous grower, and bears well as a standard. Rogers, who appears to have paid more attention to stocks than almost any author we have consulted, says, in speaking of the Orange Apricot being budded on the muscle plum, that "such may do for a wall, as they soon come into bearing; but they are not equal to those budded standard-high on the Brussels stock; for it is quite certain that there are but four sorts of fruit trees that will do well for standards from the bud or graft, when worked near the ground; viz., peaches, nectarines, pears, and apples. Cherries, when so worked, may shoot strongly, but the trees are short-lived." The Orange Apricot is a good bearer, and is chiefly used for preserving.
7. Royal. [*Syn.*, Abricot Royal.]—Originated about the beginning of the present century, in the gardens of the Luxembourg. Size, large; form, oval, slightly flattened; colour, dull yellow, with a slight dash of red where most exposed; flesh, very firm, pale orange; suture, shallow; flavour, excellent; stone, oval, large, adhering to the flesh; kernel, slightly bitter; ripens the beginning of August. The newest Apricot of any merit, and noticed only by the more recent authors, who all agree in considering it but little inferior to the Moorpark.
8. Turkey. [*Syn.*, Large Turkey.]—When or where originated or even introduced, does not appear to be known. Size, medium; form, nearly round, not at all compressed; colour, deep yellow, with many brownish spots on the side next the sun; flesh, firm, pale yellow; flavour, agreeable; stone, resembling that of the Moorpark, but destitute of the pervious passage, separating freely from the flesh; kernel, sweet; ripens about the middle of August, and that so gradually that the fruit is seen in perfection longer than any other sort; habit, healthy, leaves large, requiring that the branches be trained at a greater distance apart than in other kinds; flowers, large. The muscle stock is best for dwarfs, and the Brussels for standards.

To these might be added some others, particularly the red and white Masculines, which are to be met with in gardens: but the above eight sorts we consider to be the best, and quite sufficient for a garden of the largest size. Indeed, for the generality of gardens we should say that the Moorpark alone was sufficient, being by far the best fruit of the family.

We may here venture to correct an error fallen into by Mr. G. Lindley, and sanctioned by his talented son, Professor Lindley, namely, that "Apricots will not succeed in the Highlands of Scotland, except in the most favourable situations, and when planted against a south wall." We have seen very excellent crops of this fruit produced in many gardens in the Highlands of Perthshire; and we know from good authority that they also ripen well in Ross-shire, Aberdeenshire, Moray, and Inverness. Gardens in the Highlands are usually situated at the base of hills, in valleys or glens, where the heat of summer is reflected back from the rocks which surround them, and if the summer is of shorter duration than with us in the south, it is more uniform and warm. Pennant remarks this in his interesting Tour, and states that peaches were ripe in the garden of Braham Castle, the seat of M'Kenzie, of Seaforth, at so early a period as quite to astonish him.

The following systematic arrangement of Apricots has been drawn up by Mr. Robert Thompson, of the Horticultural Society's Garden, and published in the Transactions of that body, vol. i. p. 56, second series.

I.—KERNELS, BITTER.

* *Fruit small, round, early.*
1. Red Masculine
2. White Masculine

** *Fruit large*
† *Channel of the stone closed up.*
¶ *Flesh parting from the stone.*
3. Large Early
4. Roman
5. Blotched-leaved Roman
6. Royal
7. Brussels
8. Shipley's
9. Almond

¶¶ *Flesh adhering to the stone.*
10. Montgamet

†† *Channel of the stone pervious.*
11. Moorpark
12. Hemskirke

II.—KERNELS, SWEET.

* *Flesh parting from the stone.*
13. Breda
14. Angoumois
15. Musch Musch
16. Turkey

** *Flesh adhering to the stone.*
17. Orange.

PROPAGATION OF THE APRICOT.

The Apricot is sometimes propagated by seeds, with the view of obtaining new varieties. (For the manner, &c., see PEACH and NECTARINE.) The most usual method of multiplying the known kinds, is by budding, and sometimes by grafting. The stocks in general use are the following, viz.:—

Stocks.—The Brussels, or St. Julien plum stock, has been long known and approved of in the English nurseries; and although, as it is observed by Rogers, it is "not noticed by London and Wise, in the second edition of their work, published in 1699," it was, nevertheless, long used "in the Brompton Park nursery before that period, and has continued to be propagated as a stock ever since, chiefly for its vigorous and upright growth, arriving at its standard height often in the second year. This variety seldom bears fruit; and when it does, it is of a very inferior description." Rogers remarks that Miller, even in the seventh edition of his "Gardener's Dictionary," was very much mistaken in recommending this stock for peaches, as it is by no means well adapted for that purpose, being too full of sap during the budding season. And yet Miller has followers at the present day; which is more to be wondered at, as they, living so long after him, ought to know better." We find, also, that Mr. G. Lindley, who seems to entertain a very indifferent opinion of the Brompton stock, and considers the Brussels as fit for temporary purposes only, says,—"When standard trees are wanted for a temporary covering for the upper part of high walls, till intermediate dwarfs are large enough to occupy their places, the practice of budding standard-high upon the Brussels stock may be allowed," that is to say for Apricots, "but to bud Apricots, or any other fruit, upon the Brompton stock, is a practice which ought to be discontinued, even for a temporary purpose. When trees of a more permanent character are required, the substitution of such a stock cannot be too strongly condemned. Indeed, I hope the day is not far distant, when so worthless a stock will be banished from every nursery in the kingdom. I speak," says Mr. Lindley, "thus forcibly, having been compelled to burn many hundreds of beautiful-looking trees of peaches, nectarines, and apricots, of two and three years' training, which had become wholly worthless, in consequence of their having been budded upon the Brompton stock."

The Apricot stock is obtained by sowing the stones of the fruit; but after sufficient trial, both in this country and on the Continent, they have been found far inferior to the next sorts, or, indeed, to any stock of the plum kind.

The late T. A. Knight, Esq., is the only authority we have met with who differs from this opinion, as we find him, in a communication to the Horticultural Society, vol. ii. p. 19, recommending budding the Moorpark on the Apricot stock, as he found it prevents the trees of this, our very best sort, from becoming diseased and debilitated, which they generally do when on a plum stock,—whole branches dying off without any apparent cause. In this matter, we find Mr. G. Lindley of a different opinion:—"I am," he says, "persuaded that if it were budded on the Muscle, the trees would be better, last longer in a state of health and vigour, and produce their fruit superior both in size and quality. And Rogers, in alluding to this singular disease, acknowledges his total ignorance both of its cause and remedy. We fear, therefore, that Mr. Knight has been too sanguine in his conclusion, as the disease appears to exist in all kinds of soil, modes of planting, situation, and altogether under the most opposite circumstances. Mr. Lindley, as above quoted, seems to think this only a local disease; but we are convinced by experience that such is not exactly the case. "The Moorpark Apricot," says he, "in some situations, is apt to be affected by canker in different parts of the tree, thereby occasioning a partial loss of its limbs. When this takes place in old trees, it is too late to apply a remedy: but its occurrence may be prevented, by taking up the young tree after it has been trained three or four years, cutting off close those roots which have a perpendicular direction, spreading out the others horizontally, and re-planting it taking care that the part where it had been budded be kept six or eight inches above the surface of the ground. If this is carefully performed, without shaking the mould off the roots, the progress of the tree will be little impeded by the operation. At the end of three years more, this should be repeated in the same manner, after which it will rarely happen that any of those local injuries will take place."

The Muscle plum stock is obtained from seeds and by laying; it is cultivated in great quantities by our respected friend, Mr. Donald, of Woking, in Surrey, one of the best-informed and most respectable nurserymen we know. The common plum stock is obtained in the same manner as the last, and is considered one of the best stocks for the Apricot. The pear plum stock is also used for the Apricot; and we find Hitt recommending the common red-wheat plum as being the most proper, both for improving the quality and flavour of the fruit, as well as by being free from gum and suckers.

Budding.—The propagation of the Apricot by budding is, in all respects, the same as the Peach and Nectarine, (*which see*).

Season of Planting.—The best season for this operation in light soils, is in autumn, as soon as the leaf begins to fall; but in strong and wet soils, and in late and cold situations, the month of February and the beginning of March are to be preferred.

Soil.—A light, moderately rich soil, upon a perfectly dry bottom, and not more than two feet and a half in depth, will be found congenial to this tree. If the borders have to be made new, and the soil brought for the purpose be fresh, and not naturally too poor, it will be much better than adding additional richness to it in the shape of manure.

Pruning and Training.—The Apricot is sometimes planted as a standard, and, in climates sufficiently favourable, produces abundance of excellent fruit in this way. The principal pruning which such trees require, is merely a regulation of the branches when they become too crowded, which is seldom the case, as the Apricot is not, when treated as a standard, remarkable for luxuriance of growth. Great care, however, must be taken to cut off as few large branches as possible, as all stone-fruit trees suffer much more from amputations of the old wood, than others do: a judicious shortening and thinning of the young wood ought to be strictly attended to, and that, and a regular removal of all unhealthy or dead wood, is the amount of pruning required. The Breda and Brussels are the sorts usually planted as standards.

Apricots are also sometimes trained against espaliers, but more generally against walls, and for the most part in the fan manner, although sometimes horizontally, as recommended by Forsyth and Harrison. They bear chiefly upon the young shoots of the preceding year, and sometimes upon spurs arising out of the two- or three-year old wood. The Moorpark produces its finest fruit on the last year's wood, and would do so generally if that wood were more encouraged, and the spurs arising out of the old wood rubbed entirely off. The fan mode of training, and the encouragement of young wood, are, in our opinion, the two leading features in the management of the Apricot. Fruit is, no doubt, produced on spurs, but it is both smaller and inferior in quantity and quality to that which is produced on the young wood.

Newly-planted young trees require a species of pruning to modify them into proper shape and form; but, as this is not different from the early pruning of the Peach and Nectarine, the reader is referred to that part of this work.

Established trees require a general winter and summer pruning, as well as an intermediate examination towards autumn. Some persons recommend winter pruning to be commenced as early as the fall of the leaf, and to be continued, according to circumstances, during winter. We think this, so far as stone-fruits are concerned, a very injudicious mode of procedure; and we perfectly agree with Forsyth, who says—"I have a great dislike to autumnal pruning of fruit trees—of all kinds of stone fruit in particular; for by pruning at that season you seldom fail to bring on canker, and no fruit trees are more liable to this disease than the Apricot. The reason is obvious: the great acidity of these trees, the exposure of the wounds, and the dormant state of the sap, predispose it to mortification; whereas, in spring, when the sap is beginning to flow, and will follow the knife, the lips will quickly grow. If the branches are small, a fresh bark and fresh wood will in one season completely cover the wound; but if large, a time proportionate to their size will be occupied." By pruning in autumn, or early in winter, the wounds are often acted on by the frost, and frequently so much injured, as to lay the foundation of the canker, gum, and often the death of the shoot. The process of pruning at this season comprehends a general regulation of all the branches of which the tree is formed, a total reduction of diseased and useless wood and spray, and a partial cutting out of old bearing wood for the encouragement of the young. "A general supply of the most regular-placed young shoots must be every where retained, for successional bearers the ensuing year. Cut out some of the most naked part of the two last years' bearers, and naked old branches not furnished with competent supplies of young wood, or with fruit spurs, either to their origin, or to some well-directed lateral, as most expedient to make room for training in a general supply of the new bearers to be retained." "Generally observe, in this pruning, to retain one leading shoot at the end of each branch, either in a naturally-placed terminal, or where an opening is to be furnished; one formed into a proper leader by cutting. Let the shoots retained for bearers be moderately shortened; strong shoots reduce in the least proportion, cutting off one-fourth, or less, of their length; from weak shoots take away a third, and sometimes half;" and where a shoot is very weak, and a considerable space to fill, it may be cut into two or three eyes, which, if each of them spring, will afford a sufficient supply, and these will be much stronger than if the shoot were left at a much greater length. "This shortening will conduce to the production of a sufficiency of lateral shoots the ensuing summer, from the lower and middle placed eyes; whereas, without it, the new shoots would proceed mostly from the top, and leave the under part of the branches naked, and the lower and middle parts of the tree unfurnished with proper supplies of bearing wood. Never prune below all the blossom buds except to provide wood, in which case, cut nearer to the origin of the branch."—*Abercrombie.*

In regulating the number and length that each young shoot is to be left at, much depends on the condition of the tree: if it is of moderate growth, which is the best state it can be in, the young shoots may be shortened to about one-third of their whole length. For example, a shoot of fifteen or eighteen inches in length should be cut to about ten or twelve, while those that are not more than ten or twelve inches long should be shortened to five or six inches. If the tree is sickly or weak, cut the young wood in to a few inches; if it is luxuriant and strong, prune long, and even sometimes lay the stronger branches in at their full length. The more a strong growing tree is cut, the stronger will it grow; and on the same principle, the more the branches of a weak growing tree are shortened, the more healthy and luxuriant will they send out their young wood. In pruning the Apricot the same rule must be followed as will be hereafter recommended for the peach, namely, in shortening a young shoot to cut always at a wood-bud, which can easily be distinguished from a fruit or flower-bud, the latter being rounder and more turgid. When the process of pruning is completed, the branches should be fastened again to the wall or espalier, and in doing so care must be taken that they be laid in in regular order, according to the system of training to be followed; and in nailing, the shreds should be long enough to allow the shoot sufficient room to swell, and the nails placed in a slanting direction, so that they may not touch the wood.

The summer pruning of Apricots consists in going over the trees about the beginning of May, and rubbing off with the finger and thumb all irregular, ill-placed shoots, as well as such as may be deemed superfluous, when they are about an inch or two in length. This operation is called disbudding, and is of vast importance to the trees, by disburdening them of an unnecessary load of shoots and foliage, and throwing a greater share of sap into those that remain. In June this examination should be again repeated, at which time such luxuriant-growing shoots as can be spared (indeed, all of them, if not immediately required to fill up a vacancy in the wall) should be cut out, and also very weak ones, selecting only those of medium growth, and which latter should be laid in between the larger branches in regular order. The coarse and luxuriant shoots removed should be cut out quite close to the old wood, leaving no part of them to throw out smaller sprays at their base. A few young shoots more than may be wanted to remain over the spring pruning should be laid in towards the centre and bottom of the trees, in the event of any accident occurring, such as the loss of a branch or two during the summer, a circumstance which often happens to the Moorpark in particular; so that by making this provision there will be a supply of young shoots to bring into training, to replace such as die, or shall be removed on account of disease, or the like.

The process of disbudding should not be deferred too long, for when the young shoots are too far advanced, they do not separate from the old without leaving ragged wounds, which in all stone fruit should be guarded against, as having a tendency to bring on canker, gum, and other diseases, to which the Apricot is more liable than the pear or apple.

Those branches which are furnished with fruit should in most cases have all the young shoots removed, excepting those which serve to convey nourishment, viz., such as are placed above it, and one at the base of the shoot to serve as a successional one, because the leaves, being the chief laboratories of the sap, return the proper juices by the vessels of the foot-stalk and bark.

" In the case of trees which are in too luxuriant a state of growth, producing rank, vigorous shoots, which never become good bearers till they be reduced to a moderate size, retain as many of these shoots in all parts, or in any part, of the trees, as can be conveniently trained in, and at their whole length, all the summer; and continue this method for a year or two, in order to divert and exhaust the redundant sap, and thereby check the luxuriancy, and gradually reduce the tree to a habit of moderate shooting, and furnishing middling strong and proper bearers."—*Abercrombie.*

This, as well as allowing larger crops of fruit to remain on them, will moderate the growth of trees better than all the pruning and training that can be applied.

RENOVATING OLD AND DISEASED APRICOT TREES.—Like all other fruit trees, these will, in course of time, and from a great variety of circumstances, become unfit to remain in well-ordered gardens. Forsyth, who had great experience in heading down most sorts of trees, advises this process in the case of the Apricot. We, however, agree with Harrison in thinking that, as the Apricot is susceptible of injury when large branches are amputated, or large wounds inflicted upon it, it would be much better to plant young trees than to attempt to renovate very old or diseased ones. We need hardly caution the most inexperienced gardener against planting young fruit trees in the same spot from which large or old ones have been just removed, without a previous renovation of the border by the clearing away a portion of the old mould, and all the fragments of the roots, and adding to it a supply of fresh soil for the future nourishment of the newly-planted tree.

DISEASES TO WHICH THE APRICOT IS LIABLE.—"The Apricot tree is not liable to mildew," says the intelligent author of the Domestic Gardener's

Manual; but in this we beg to differ from him, particularly in the case of the Orange, Breda, and Brussels; "nor is it," he continues, "so much injured by insects as the peach and nectarine: the wood is hard, and the bark firm and glossy; but the branches are subject to a disease which causes an exusion of gum: and, what is of more consequence, the tree, or some of the larger branches, are sometimes struck with a kind of blast, which destroys them as suddenly as if they were struck with lightning. I once saw an old tree that had produced hundreds of fruit in the preceeding summer, had set well for bloom in the early months of the next year, had expanded that bloom and a portion of the young leaves, and was, to all appearance, in perfect health at the close of one day, but on the following morning the whole tree was dead; every blossom had collapsed, or fallen, and every leaf was withered. No one has hitherto suggested a satisfactory reason for this sudden blast, which is not of rare occurrence, at least to a partial extent. I think it has an electric origin:—I do not mean," says Mr. Towers, "that it is occasioned by a shock or stroke of electricity, but that the tree, by its physical organization, is very probably liable to an interruption of the ascending or propelling current, which, when it occurs, produces an effect as sudden and manifest as that of a paralytic stroke on the human frame, and is more immediately fatal, since it includes a total cessation of all the ascending vital fluids of the tree, or of the affected branch."

This appears to be the cause of this extraordinary effect, but how to guard against its recurrence, or prevent its appearance, remains yet unknown. The late Mr. Knight endeavoured to correct this evil, (at least so far as regards the Moorpark, which, by the way, is the most liable to the disease,) by working the young trees on stocks originated from Apricot seeds; but his expectation has not been realized, at least so far as we have been able to ascertain, to any useful extent.

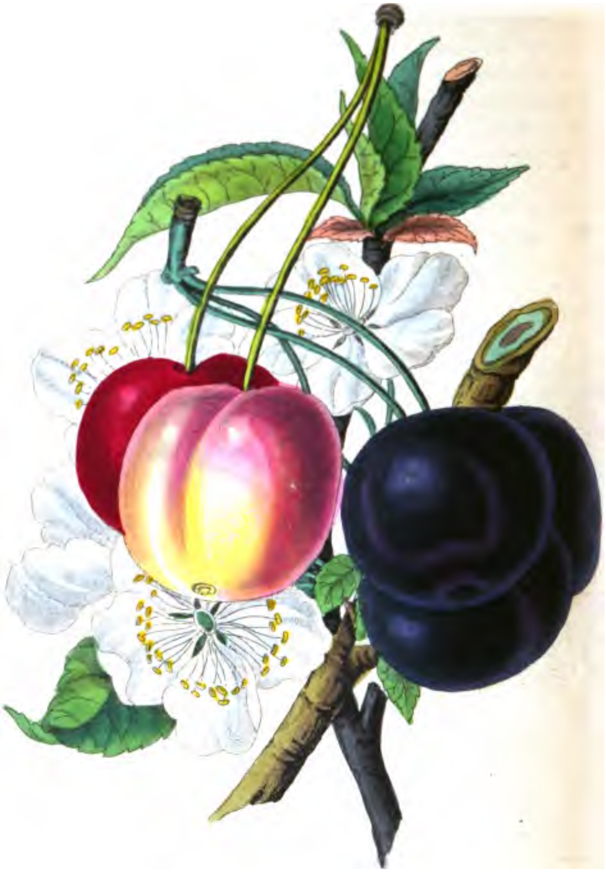
Gum and canker, to both of which the Apricot is exceedingly liable, in most situations, proceed in general from improper treatment, such as bad soil, severe pruning, injuries sustained by bruising or lacerating the bark. The usual means in those cases must be had recourse to, and the mildew, by the means which will be treated in the articles PEACH and NECTARINE.

THINNING THE FRUIT.—The Apricot in general sets its fruit in clusters, which if not thinned would render the fruit liable to push each other off; besides, they could never attain their proper size or flavour. In May, and afterwards in June, examine the trees, and begin by removing all the fruit that touch each other, and finally thin them so that they stand from six to eight inches apart. The Moorpark should be thinned even more to enable it to attain its full maturity. The author of the English Gardener lays down the following rule, viz., " a tree eight feet high, and spreading seven feet on each side of the trunk, will cover a space of one hundred and twelve square feet: the fruit, at six inches apart, would be four apricots to a foot, that is, four hundred and forty-eight apricots on the tree."

Gathering the ripe Fruit.—The Apricot, if allowed to remain on the tree till it be over-ripe, loses its aromatic flavour, becomes clammy, and is not easy of digestion. It should be gathered at least twenty-four hours before it acquires its last degree of maturity. When intended to be kept for any particular purpose beyond its natural duration, it should be gathered before it is much more than half-ripe, and placed in an ice-house, or cold chamber, where it will ripen slowly, and hence be rendered fit for the dessert a fortnight or three weeks later than if left on the tree.

Forcing the Apricot.—The Apricot is rarely forced in this country; perhaps the most successful process is that exemplified at Hylands, the seat of P. C. Labouchere, Esq., which is conducted on the Dutch principle, in pits or small houses, chiefly heated with dung. The Apricot is not held in such high repute as a dessert fruit in this country as to lead us to suppose that it will ever be forced to any considerable extent. The same mode of proceeding is required for the Apricot, as will be afterwards noticed for peaches, (*which see*).

CHERRIES.



Florence.   Black Eagle.

THE CHERRY.

The wild Cherry is considered to be a native of Britain as well as of most parts of the Continent of Europe, but the cultivated kind was brought from Pontus, by the Roman general, Lucullus, after he had vanquished Mithridates, king of that country, and planted in the gardens of Italy. Thence it was introduced into England as early as the forty-second year before Christ, although some authorities date its introduction so late as fifty-five years after the Christian era, that is, in the early part of the reign of Nero. The former date appears to be confirmed by Pliny, who says "Italy was so well stocked, that in less than twenty-six years after other lands had cherries, even as far as Britain, beyond the Ocean." It has been supposed that the cherries thus early introduced were lost, and that they were afterwards re-introduced by Harris, the fruiterer to Henry VIII.; but the poet Lydgate, who wrote in or about 1415, says that cherries were exposed in the streets of London in his time, much in the manner they are at present.

In the curious poem of Lydgate, entitled "Lickpenny," here alluded to, we find the following allusion to them:—

> "Hot pescode one began to cry,
> Straberys rype, and Cherreys in the ryse.*"

Some imagine that Harris only introduced the Flanders Cherry; and we think this the more likely, as it is still preferred for the purposes of confectionary.

May not the wild cherries of our woods have had their origin from the birds carrying the fruit of the cultivated sorts out of gardens?

Lucullus, it would appear, held this tree in high esteem, for when he was granted a triumph at the conclusion of the Mithridatic war, he had it placed in a conspicuous position among the treasures he had obtained.

The principal cherry orchards in England are in the county of Kent, where they were probably first planted, as Cæsar speaks more favourably of it than of any part of the island that he visited.

The medicinal properties of the Cherry have been variously estimated: Pliny says that the fruit eaten fresh from the tree, when the morning dew is upon them, the stones being also swallowed, will purge so effectually as to cure those who have the gout in their feet: many a victim to this dreadful disease would, we are certain, make the pleasant experiment if they had faith in the prescription.

In the English Dispensatory Dr. Quincey says, "Many of the sorts, and particularly the Kentish red cherries, are a very wholesome fruit, and grateful to the stomach, but the black only are used in medicine; they are prescribed in all diseases of the head and nerves, and by some are accounted diuretic, especially the water distilled from them." The wild cherries of our woods might be turned to good account by the peasantry, who could manufacture from them the well-known *kirschwasser*, so prized in Germany as a cordial; wine may also be made from the juice, and the fruit preserved by bottling for winter's use. The *Eau de Cerises*, an admired French liqueur, is made by steeping the small black cherry in the best brandy.

As connected with the arts, the gum which exudes from unhealthy trees is nearly as good as gum arabic; and if Hasselquist is to be credited, it must be very nutritious, as he relates a case of one hundred men being kept alive for nearly two months without any other sustenance than a small portion of this gum taken into the mouth and suffered gradually to dissolve.

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* Ryse, rice, ris, and ryce, are words still used in some parts of England, and very frequently in Scotland, meaning branches or boughs cut off trees. The very rare ballad of "London Lickpenny," was composed by John Lydgate, a famous poet, and monk of the Abbey of Bury, in Suffolk, born about 1375, and died about 1461. Many of his historical verses are still preserved, written on parchment, in the Harleian collection of MSS. in the British Museum.

The wood is in much request by musical-instrument makers, cabinet-makers, and turners. The timber of the wild cherry comes to perfection in about forty years, and the longevity of the cultivated sorts must be great, particularly the Flemish or Kentish, as in an orchard at East Mousley many trees are still productive, which are said to have existed for nearly two centuries.

The name Cherry is pretty generally admitted to be derived from Cerasus, a city of Pontus, in Asia, where it is said to have been first discovered.

"Pliny mentions eight kinds of cherries as being cultivated in Italy when he wrote his Natural History, which was about 17 A.D. 'The reddest cherries,' continues he, 'are called *apronia*, the blackest, *actia;* the Cæcilian are round. The Julian cherries have a pleasant taste, but are so tender that they must be eaten when gathered, as they will not endure carriage.' The Duracine cherries are esteemed the best: but in Picardy the Portugal cherries are most admired. The Macedonian cherries grow on dwarf trees; and one kind is mentioned by the above author which never appeared ripe, having a hue between green, red, and black."—*Pomarium Britannicum.*

From the above quotation it would appear that cherries have not multiplied so fast into varieties as most other fruits; the cause is difficult to account for.

VARIETIES ENUMERATED OR DESCRIBED BY VARIOUS BRITISH AUTHORS.—Tusser mentions cherries red and black; Parkinson, thirty-four sorts; Ray, twenty-four; Miller, eighteen, and at the same time observes, that "others are continually adding, differing little from those he has described." Forsyth describes eighteen sorts, some of which are identically the same, and enumerates besides twenty-three others, many of which are of little merit. Mr. Lindley describes twenty-eight kinds; Nicol, eight; Rogers, twenty-five; the Hort. Soc. Fruit Catalogue, fifty-seven, which are arranged by Mr. Thompson in a very able and perspicuous manner. The last edition of the Ency. of Gard. describes twenty-three sorts.

SELECT LIST OF CHERRIES.

1. **Bigarreau.** [*Syn.*, Turkey Bigarreau, Graffion.]—Introduced from Turkey into France, from whence it came into England about the middle of the last century. Size, large; form, heart-shaped, but somewhat irregular, rather flat at the eye; colour, palish yellow, tinged with red next the sun, when fully ripened becoming amber-coloured; pulp, firm, adhering to the stone; stalk, two inches long, inserted in a deep cavity; juice, rich, and peculiarly high-flavoured, less plentiful than in most cherries; stone, large and round; ripens about the end of July, or the beginning of August; habit, after the third or fourth year of its growth it becomes a great bearer; it is the strongest and most upright grower in its young wood of all cherries, and with the exception of the tobacco-leaved (a very worthless sort) has the largest leaves. It is rather too tender for a standard orchard tree unless in the most favourable situations, but its great merit demands for it a place on an east and west wall, where it should be trained, thin of branches, on account of the large size of the leaves.
2. **Black Eagle.**—Originated at Downton Castle, about 1806, the seat of the late Mr. Knight, from seeds of the Bigarreau, impregnated by the pollen of the May-Duke. Size, large; form, heart-shaped, compressed both at the apex and base; colour, deep purple, nearly black; juice, abundant, rich, and highly flavoured; stalk, long, and rather slender: pulp, tender and bleeding; ripens on walls about the end of July, or the beginning of August; habit, strong and vigorous, producing its fruit generally by twos or threes, and sometimes in bunches of ten or twelve cherries each; leaves, large; too tender, we suspect, for an open orchard standard; its excellence claims for it a place on an east, west, or north wall.
3. **Black Circassian.** [*Syn.*, Superb Circassian, Black Russian, Black Tartarian, Fraser's Black Tartarian, Ronald's Large Black Heart, Fraser's Black Heart.]—Introduced in 1796, by the late Mr. Fraser, from Russia. Hooker, however, in Pomona Londinensis, states its introduction to have been through Mr. Ronalds, of Brentford, in 1794, and that he had received it direct from Circassia. Another account traces its origin to Spain, from whence it was transmitted to Russia, and afterwards to England. The latter account we place little credit in, and believe it to be of Circassian growth. That both Ronalds and Fraser should have received it at nearly the same period is not at all wonderful, but that the latter had the greatest chance of it may be concluded from the circumstance of his being a man of enterprizing character, and a zealous collector of rare plants, and may have discovered it in some of his journeys through the north-west of Russia. "He was appointed nurseryman to the Autocrat of all the Russias," which, as Rogers very justly remarks, "was a poor recompence for all his toil and expensive journeys in the Czar's dominions." Fruit, large; form, heart-shaped, of an irregular surface; colour, purplish, shining black when fully ripe; stalk, above an inch and a half in length, slender; stone, roundish oval, middle-sized; pulp, juicy and rich; juice, purplish, much the same colour as the skin;

ripens on east or west walls about the beginning or middle of August; habit, healthy, strong, and robust; leaves, rather large, requiring to be trained thin in the branches; bears well as a standard, but highly deserving a wall.

4. Black Heart. [*Syn.*, Guignier à fruit noir of the French.]—Introduced before the time of Miller. An old and excellent variety, whose only fault is a liability to crack in wet seasons. Size, above the medium, taking for example the May-Duke for our standard; colour, black, or the darkest shade of purple; form, heart-shaped, somewhat compressed at the apex; stalk, slender, an inch and a half long; pulp, pale red and firm; juice, rich and well-flavoured; ripens about the beginning of August; habit, a rapid grower while young, attaining to a large size: it is, therefore, unfit to be trained as a dwarf.

5. Couronne. [Coroun, Corone, Hertfordshire Cherry.]—Originated in England, where it is often found in its natural state. It is a famous old hardy sort, and is cultivated extensively in Hertfordshire, Norfolk, and some parts of Bucks. Fruit, middle-sized; form, heart-shaped, somewhat resembling the last; colour, deep purple or black; stalk, slender, two inches long, inserted in a deep cavity; pulp, very firm, and, therefore, well suited for being sent to a distance without injury; juice, sweet and high-flavoured; ripens on standards about the end of June, or beginning of August; habit, one of the hardiest and surest bearers we have, attaining the size of a very large timber tree, and not at all choice in respect to soil, thriving on almost all soils alike well. It is remarked of this sort that it reproduces itself from seeds with greater certainty than any other.

6. Downton.—Originated by the late Mr. Knight, at Downton Castle, from a seed of either the Waterloo or Elton, but which, it is not quite certain. Size, medium; form, somewhat heart-shaped, or nearly round, compressed on one side; colour, pale yellowish, sprinkled with many red dots, partly red or maroon on the sunny side; stalk, slender, deeply sunk; pulp, pale amber, tender, without any stain of red, slightly adhering to the stone; juice, plentiful and high flavoured; ripens about the end of July; habit, healthy, and adapted for standard culture.

7. Elton.—Originated by Mr. Knight, in 1806, from a seed of the Bigarreau, fertilized by the pollen of the White Heart. Size, above the medium; form, heart-shaped; colour, pale waxy yellow, mottled with rich red on the side next the sun; stalk, slender, about two inches long; pulp, firm; juice, very sweet and rich; ripens about the middle of July; habit, healthy, and moderately luxuriant, succeeds well as a standard, but deserves a wall.

8. Florence.—Introduced in 1780, from Florence, by Mr. Houblon, of Hallingbury Place, Essex. Fruit, large; colour, pale amber, marbled with pale red, very bright red where exposed to the sun; form, heart-shaped, compressed slightly on one side; stalk, long and slender, placed in a deep cavity; pulp, white and firm; juice, abundant, sweet, and rich; ripens about the beginning of August; habit, erect, of moderate growth, and well adapted for training in any way; as an Italian variety, it must be looked upon as a tender tree for our climate.

9. Knight's Early Black.—Originated about 1810, by the lamented gentleman whose name it bears, from a seed of the Bigarreau, fertilized by the pollen of the May-Duke, but from the colour of both it has sported. Size, above the medium; form, heart-shaped, with that uneven sort of surface natural to the Black Circassian; colour, nearly black; stalk, two inches long, set in a deep cavity;

pulp, firm, deep purple; juice, abundant, sweet, and high-flavoured; leaves, large, therefore it should be kept thin of branches; ripens about the beginning of July on standards, or about ten days prior to the May-Duke, its male parent, and about the middle of June, on a south wall; the best of all our early cherries; habit, healthy, and sufficiently hardy to succeed as an open standard. It is singular that this and the Elton should have originated from the same source, and yet be so very dissimilar in colour and time of ripening, &c.

10. Late Duke.—Rogers has not only identified the Arch-Duke to be only a synonyme, but he has also added Holman's Duke to it. Mr. Lindley appears to have had his doubts regarding the former of these, for he says, "This cherry," the Late Duke, "has a great affinity to the Arch-Duke, if not absolutely the same," and we think Mr. Thompson is of the same opinion. It is, however, more difficult to reconcile the opinion of Rogers and Lindley as to the identity of the Late Duke and Holman's Duke; for while the former says he has proved them to be the same, only grown under different circumstances of soil and situation, the latter declares the Holman's Duke a distinct species of Duke, and that it cannot well be confounded with any other. However anxious we are to curtail the string of duplicate names of fruits, we are unwilling to decide in this case without farther examination. Size, rather above the medium; form, bluntly heart-shaped, somewhat compressed; colour, shining red; pulp, amber-coloured; juice, plentiful and rich; stone, large, roundish oval, slightly flattened; ripens in August; habit, hardy, and of upright growth, not adapted for a dwarf, as it would require too much pruning. "This variety," Rogers observes, "is becoming rather scarce, owing, perhaps, to its being a shy bearer when young, more especially if planted in over-rich, deep soils. But if planted in a thin, light soil, and on a north aspect in the garden, it is fruitful, and if preserved from birds, is very acceptable in the dessert at so late a season."

11. May Duke. [*Syn.*, Royal Native of the French.]—It is not a little singular that this variety, which is perhaps one of the oldest in cultivation, and mentioned by Ray, should have passed down to us without the addition of a single synonyme. So well-known a cherry requires no description here. In regard to its history we may here quote Rogers, who says, "For early prolificacy the May Duke is unequalled, and though there have been many pretended varieties of it, and to which new names have been given, they are all reduceable into the old original, first introduced into this country from France, above one hundred and fifty years ago. It is mentioned by Duhamel, and before him it is described by M. Merlet, under the name of Cerise Royale Native, a character it well deserves, as being not only early, but worthy of being partaken of by the greatest monarch that ever swayed a sceptre." This variety is certainly the best for forcing.

12. Morello. [*Syn.*, Milan.]—When introduced or how originated, we have no certain account. That it has been an old inhabitant of our gardens is certain. It is mentioned by Parkinson, in 1629, who says the name is derived from Morus, the mulberry, because the juice of this cherry is like the juice of that fruit. This is another variety so generally well known as to require no description here. We may, however, remark, that it will ripen its fruit to perfection on standards in favourable situations, and also upon espaliers, if in a warm and sunny exposure. North walls are their general places of growth, and on these they attain their fullest size and maturity for the use of the confectioners,

to whom it is more valuable than any other cherry. It may also be prolonged on north walls by netting over and afterwards by matting them, or by covering them with a temporary frame and glasses, till nearly Christmas. Upon east and south-east walls a tree or two might be planted, and these would attain a degree of ripened perfection that would render them a valuable acquisition in the dessert. Sometimes a tree of this sort is planted even on a southern aspect, and the fruit so produced is, when fully ripe and beginning to shrivel, found to be most excellent. As a free circulation of air and full exposure to the sun are of the utmost importance for promoting the full maturation of all fruits, it follows that Morellos cultivated with the view of becoming dessert fruit should be trained thin of branches, so as to admit as much sun and air, and as little shade from the foliage as possible.

13. Waterloo.—Originated by a daughter of the late Mr. Knight, from a seed of the Bigarreau, fertilized by the pollen of the May Duke, and received its name from having first produced its fruit about the time of that celebrated battle. Size, large; form, roundish; colour, brownish red at first, changing to black when fully ripe; stalk, long and slender; pulp, firm; juice, plentiful and high flavoured; ripens about the middle of August; habit, moderate in growth, better calculated for garden than for orchard culture; perhaps it should have even in the former case the benefit of a south-west wall.

14. White Heart.—Introduced from France many years ago, as it is figured by Langley in his Pomona. Size, above the medium; form, heart-shaped, as the name implies; colour, dullish white yellow, mottled with dull red on the side next the sun; stalk, very slender, about two inches in length, placed in a deep cavity; pulp, firm; juice, rich and sweet; ripens about the beginning of August; habit, of rather straggling growth as a standard, an excellent bearer, and much less generally cultivated now than it ought to be.

15. Kentish. [*Syn.*, Flemish.]—Supposed to have been introduced from Flanders by Harris, fruiterer to Henry VIII., and first planted in Kent, near Sittingbourne, which accounts for both names. Most cultivators consider them to be the same thing, and that the difference of names is owing to Miller having used the one and Langley the other. "In a lately published catalogue," Rogers, with some point and good sense, remarks, "the one is said to have an aqueous, while the other has a watery sap, which is a distinction without a difference." And Mr. Thompson, on whose judgment we place the greatest confidence, appears to make their difference consist in the one being a great and the other a moderate bearer, and that the one has drooping shoots, while the others are more upright — circumstances which we suspect arise from cultivation, soil, or the constitutional strength or vigour of the trees, but certainly not sufficient to stamp them distinct kinds.

PROPAGATION OF THE CHERRY.

The Cherry is propagated by seeds, with a view to obtain new varieties, and by budding and grafting, to continue or perpetuate known or approved varieties. The latter mode is in most repute.

Seeds.—The seeds of the black or wild cherry are sown to obtain stocks, as they are more hardy and durable than stocks raised from the stones of the cultivated sorts. The Morello is sometimes sown for stocks, as some cultivators imagine that working upon this stock has a tendency to dwarf the tree and render it more prolific; others have recommended the Mahaleb, a weak-growing species of prune, for the same purpose. "The fruit for stocks should be gathered when fully ripe, and laid up in dry sand till the spring; when, upon the first appearance of the stones opening, they should be sown on beds of dry, light soil, about three or four feet wide, and well defended from birds and mice."—*Rogers*. Some cultivators content themselves with the stones of any of the cultivated kinds, because they are more easily procured; but this practice is highly reprehensible, and to it may be traced many of the misfortunes which befall the cherry, particularly while young.

The seeds of the cultivated Cherry should only be sown when the object is to obtain new or improved varieties; but to effect this with any degree of certainty, artificial fecundation must take place. The late Mr. Knight was eminently successful in this respect, and was rewarded by obtaining the following, viz., Knight's Early Black, a hybrid between the Bigarreau and May Duke, Black Eagle, Downton, Elton, Waterloo, &c. "The cherry," Mr. Knight observes, "sports more extensively into varieties, when propagated from seeds, than any other fruit which I have hitherto subjected to experiment: and this species of fruit is, therefore, probably capable of acquiring a higher state of perfection than it has ever yet attained. New varieties are also much wanted, for the trees of the best old kinds are every where in a state of decay in the cherry orchards; and I am quite confident," continues he, "that neither healthy nor productive trees will ever be obtained from grafts and buds of the old and expended varieties of this or any other species of tree." This favourite theory of Mr. Knight has been sufficiently canvassed, and we believe that the correctness of the doctrine cannot be disputed.

Layers.—Cherries may no doubt be made to root by layers, but it is very rarely practised: indeed, we recollect no published account of this mode of propagation except that of Hitt, who, describing the Baramdam cherry, (a sort we cannot now recognize), and which he says was natural to a place of that name in Lincolnshire, and that it increased by suckers like black-thorns, and bore upon as small bushes, observes, "These will root well the first year of laying, and I think, " he adds, "that the best way to propagate them, for the common kinds made use of for stocks are not so good, being subject to make strong downright roots, whereas these are very fibrous, and grow very near the surface." He further states that he has propagated the Duke Cherry upon them, and asserts that it is not so subject to blight as it is when wrought upon the wild, black, or red sorts.

BUDDING.—The Cherry is in general propagated by budding, when standard trees are desired, and the stocks require generally three or four years' growth to fit them for this purpose. The operation is performed in summer in the usual manner, and such as fail by this mode are grafted in the spring following. When planted out in their final destination, they will require to be headed down. "On this account," says Lindley, "they ought never to be planted later than the end of October, or the middle of November; this early planting will enable the trees to make fresh roots previous to the spring, when, in April, as soon as the buds begin to break out, they should be headed down to within three or four inches of the place where they had been budded. If the trees be good, there will be a sufficient number of eyes to produce as many shoots as will be required to furnish the head: should more than four be produced, they should be reduced to that number, of such as are the best placed. These must be allowed to extend at length without being shortened, nothing further being required than to cut out superfluous shoots, so as to keep the head uniform and handsome. If the heads of young trees be carefully attended to for the first three or four years, they will rarely get into confusion afterwards: they must, nevertheless, be looked over frequently, as shoots are occasionally produced through a local injury of the branch, which may require to be removed.

GRAFTING.—Grafting is the mode of propagation most preferred for dwarf trees, as those originated in this way make better plants than by budding. Therefore, all trees intended for walls and espaliers should be so propagated.

STOCKS.—We have already remarked that the best and most permanent stocks are those originated from stones of the wild black and red Cherry. The stones of the cultivated kinds should not be used for this purpose. The Morello is often chosen as a stock when dwarf trees are desirable; it is also said to render the tree more productive. Dubreuil, a French gardener, recommends the wild stock for clayey and light soils, and the Mahaleb for soils of a light, sandy, or chalky nature.

SOIL.—A light, sandy, loamy soil upon a dry subsoil is the best for cherries, and in an exposure as airy and as little subject to damp fogs as possible. The May Duke and Morello are less choice in this respect; they appear to thrive in ordinary soils, and in most situations. The fine

Kentish cherry orchards are usually in fine deep loam, incumbent on rock. In dry, gravelly soils they do not grow well, are short-lived, and subject to blights (that is, the attacks of insects) in spring.

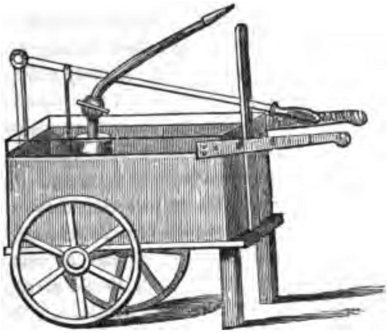
PLANTING.—The proper season for planting is from the middle of October till the middle of March; this, as in all similar cases, depending on the soil and season. Early autumnal planting is best on light, poor soils, and for trees intended to be headed back, while late spring planting is the most proper in strong and wet soils. The Cherry should be removed in mild weather, and also in moist, showery days, but not when the ground is at all saturated. It is difficult to lay down any rules as to the exact distance at which fruit trees should be planted,—so much depends on the soil, and the probability of the trees attaining a larger or a smaller size. Thirty feet may be considered the maximum distance in the very best soils, and when the trees are expected to attain their greatest size, and from eight to ten feet when the soil is poor, and where the trees will continue of small stature. Miller is very definite on this subject; he says, "Never plant standard or rider cherry trees over other fruits, for there is no sort of fruit that will prosper well under the drip of cherries." This opinion, however, wants confirmation. Cherries are usually (in gardens) planted against walls more with the view (excepting to have some of the early kinds ripened sooner) of enabling the cultivator to protect them against the attacks of birds, &c., than with the expectation of having finer fruit. For this tree will, in most parts of England, produce equally good fruit on standards as on walls, but standard trees are difficult to net over, while wall trees are easily covered in this way. To plant dwarf trees in a compartment by themselves is an excellent plan, which has been exemplified at Hylands, in Essex. The trees are retained dwarf, are planted pretty closely together, the compartment is inclosed within a wire fence sufficiently fine to exclude birds, and at the season when the fruit begins to ripen, the whole is covered with netting, elevated on neat posts placed at regular distances. By this arrangement the proprietor or his friends can have ready access to his cherry orchard, the fruit can be preserved as long as they will hang on the tree, and hence attain their full flavour, and prolong their season to the latest extent. As a modification on this plan, our friend E. Turrell, Esq., of the Royal Gardens, Hampton Court, plants cherry trees along the side of some of his walks, training the leading branches pendulous, so as to keep them within six or eight feet of the ground. These trees are, when coming into bloom, hooped over with hazel rods, about six inches apart, and braced together by having longitudinal rods made fast to them, about three feet distant from each other, forming a curvilinear passage or structure, over which he stretches netting to protect the blossom, and afterwards the fruit. This is evidently the most simple and economical mode of growing standard cherries with which we are acquainted, and, being within the reach of every person having a garden, cannot be too strongly recommended for their adoption.

PRUNING STANDARD CHERRIES.—Standard cherries, when once established, require very little pruning. They in general produce fruit upon spurs, which proceed from the sides of the two-year, three-year, and older branches; these spurs continue to make their appearance along the whole length of the shoots. It is, therefore, a general rule not to shorten the bearing branches, unless where it may appear necessary to do so to obtain two or more young shoots; but this is not often the case. The Morello is, however, an exception to this rule, as it bears principally on the shoots of the last year's growth, and seldom under good management on spurs. Therefore, in pruning them, a sufficient supply of young wood should be retained, and as a consequence, a corresponding portion of the old wood that has once produced fruit removed to make room for it. It should be borne in mind that immoderate pruning is highly injurious to the Cherry, and also to the plum.

PRUNING AND TRAINING AGAINST WALLS.—The season for pruning this tree has been laid down by most authors as extending from the fall of the leaf till February or March. This may be all very well if we could calculate on mild winters, but as this is not in the fore-knowledge of man, we would recommend the operation being deferred till the latter period. The mode of pruning also depends principally on the method of training to be followed, and in some cases, as in that of the Morello, for instance, on the kind of cherry to be operated on. The general principles of pruning in this case are, modelling the tree to the mode of training, reducing superfluous and entirely removing diseased or ill-placed branches, as also shortening some branches to induce the production of others where wanted. In pruning the Cherry many fall into error by laying in too many branches: this observation holds good, not only in the case of the Morello, but of most others also; when this practice is followed, although there may be plenty, nay, a superabundance of blossom, it often occurs that there is little or no crop. This is to be accounted for by the great superfluity of branches, leaves, and flowers exhausting the strength of the trees, so as to deprive them of natural power to form perfect bloom. According to the examination of Underwood, detailed in the Memoirs of the Caledonian Hort. Society, it would appear that, out of fifty flowers produced he could only discover two styles, that is, the female part of the fructification: consequently, under the most favourable circumstances, there could only be two fruit set out of that number. We remarked this circumstance in the "Flora and Pomona," some years ago, and observed, that when there was a great show of blossoms, in general few fruit followed. When the branches are laid in moderately thin, they are individually strengthened, and, therefore, are capable of producing perfect blooms, and there is, consequently, a greater chance of these blooms setting their fruit. More air, also, is thereby admitted to aid in that very important operation, and the leaves have full scope for developing themselves completely.

With respect to the mode of training cherries planted against walls or espaliers, Forsyth and Harrison approve of the horizontal method, while most other practitioners follow the fan, or half fan and horizontal plan. Much, however, of this depends on the health and vigour of the trees: weak trees may be trained with their branches in a more elevated position, while stronger-growing ones will become more productive by being depressed even beyond the horizontal line; but both may be altered according to circumstances.

INSECTS INJURIOUS TO THE CHERRY.—"The aphis or green fly (which Rogers says is often black when feeding on the Cherry, but this we think quite a different species,) is a sad pest; they lodge and live on the points of the young shoots, distorting the leaves and stopping the growth. Their excrement is called the honey-dew, which is copiously discharged over the leaves, and, from its thick clammyness, closes the pores, and checks the perspiring functions of these organs. Fumigating the trees with tobacco smoke, syringing them with tobacco water, or dusting them when wet with Scotch snuff thrown on by a powder-puff, are the only means of killing or driving the fly from the trees." Fine slaked lime, mixed with soot, strewed over the trees in a dewy morning, will be found beneficial; or washing the infected shoots in a solution of this mixture, which may be done by bending their tops down into it, will certainly destroy the insects. Naismith, in *Caledonian Hort. Memoirs*, recommends for their destruction a mixture of pitch with one-sixteenth part of powdered orpiment, one-sixteenth part of sulphur, dissolved over a slow fire in an earthen pipkin until they are well incorporated; when cold, divide it into small pieces, about the size of a hen's egg, and burn it under the trees with damp straw, directing the smoke as much as possible where the insects are most numerous. In an hour afterwards (if the state of the fruit will admit) give the trees a good washing with the garden engine, which generally clears off the half-dead beetles, and prevents the spreading of the red spider." It is seldom, unless in very dry seasons, or when from the projecting copings of the wall that the rain and dews are prevented from falling freely on the foliage, that the latter insect makes its



appearance, and if it do, a free application of water applied with force from the garden engine, will speedily subdue it.

Diseases of the Cherry.—The most serious disease to which this tree is liable is the exudation of gum from various parts of the stem and larger branches. It is spoken of in the following terms by Rogers:—"Cherry trees are sometimes subject to the loss of sap, which, when exposed to the air, becomes thickened and is called gum. It proceeds from external wounds, or from wind shakes in the branches or stem. The remedy is, cutting away the diseased parts, and covering the wound with grafting clay, in which a good portion of soot has been incorporated." Severe pruning and accidental wounds are the chief causes of this disease.

Thinning the Fruit.—The fruit of the Cherry is, we believe, seldom thinned, but that the practice is worth the attention of the pomologist who wishes to have this fruit in its greatest perfection there can be but one opinion. The proper season for carrying this operation into effect is, when the fruit has fairly stoned; before that period it might be attended with some danger, as many naturally fall off at that time. Sharp-pointed scissors should be used, and if not more than from one to three fruit be left on each spur, their size will be very materially increased. This, however, would only be worth attending to in the case of the more choice kinds.

Protecting the Fruit from Birds.—We beg to refer the reader to what has been already hinted at on this subject in the practice of Mr. Turrell, and also at Hylands, and farther to add, that protection of some sort or other is absolutely necessary to secure the crop. Covering wall-trees with old fishing nets set out with forked sticks at least a foot or eighteen inches from the wall, and made securely fast to it round the ends and sides, is the most economical and the most secure; and for the more conveniently carrying this into effect, cherry trees should always be planted close together, and not promiscuously throughout the garden. We are not here, however, to be understood as recommending them to be all planted on the same aspect, for in that case they would ripen too nearly at the same time; but we would recommend their being planted in sections, some on south walls, others on east or west walls, and the remainder on north walls. The early kinds should of course occupy the first, and the late-ripening ones the latter situation. Trees planted as standards have not the same variety of aspects, nor would it be prudent to plant them in cold and shaded places merely to retard the ripening of the fruit, for in such a situation they seldom do well, and are, moreover, subject to be attacked by insects of various species that would not annoy them in more open and exposed places.

Forcing.—The successful production of cherries by artificial means early in the season, is considered a masterpiece in the art of forcing; as no fruit tree subjected to the same mode of treatment is more apt to fail, not only by the blossom falling off without the fruits being set, but even after the cherries have obtained a considerable size they continue still to drop till the trees are bare. The first failure may in a great measure be attributed to debility in the tree, brought on by a variety of causes, of which the following are the most common. Trees taken up late in autumn, and potted or planted in the cherry-house, are not sufficiently established with roots to form and perfect their fruits the same season, the more especially if the roots have sustained more than ordinary injury during the operation of removal: such trees will expand their blossoms (which they would almost do if the stems were immersed in water without roots at all), but in neither case can fruit be expected from them. Young luxuriant-growing trees, with strong watery shoots, and few fruit buds or spurs, even if prepared at the roots for a season previously, will expand their blossom, but few fruit will set even under the best management. Trees on which there are a superabundance of flower buds will blossom beautifully, but most of the fruit will fall, or the blossom, if it do not set, will set sparingly, because the production of an unnecessary number of blossoms weakens the tree, and upon a careful examination (even in the open air) such blossoms will be found to be defective nearly in the proportion of one perfect flower to fifty imperfect. This imperfection in most cases consists in either a total absence of the style or female organ, or in its being deformed, and incapable of performing its very important functions. The selection of improper sorts is also another cause of failure, as are also exciting them too suddenly, keeping them too dry, and not admitting a full circulation of air to them at all times from the day they are first introduced into the house till the fruit is ripe.

Trees, therefore, intended for forcing should be carefully selected; the May-Duke and Morello are the best sorts. They should be potted two years prior to their being forced, which will bring them into a rather stunted habit, making short, well-ripened shoots, and abundance of flower buds. They should not be allowed to produce any fruit until they are brought into the forcing-house, and for this purpose the blossoms should be cut off as they appear. They should be plunged up to the rims of the pots in a dry soil, and open, sunny situation, in rows, so as not to crowd or shade one another, and be well mulched all over the pots with littery dung, to exclude the heat and drought from their roots. Young luxuriant trees should not be selected, but such as have stood three or four years in the nursery lines, and have shown themselves disposed to produce fruit buds and spurs rather than wood. Such should be carefully taken up and potted. The length of the stem must be regulated according to the height and construction of the cherry-house: it will be, however, in general necessary to have some of different heights, from full standard to dwarfs: the taller to be placed at the back part of the house, and the shorter ones in front, so that all may enjoy the sun and light.

The process of thinning the superfluous fruit buds soon after their formation, is not, we believe, often practised, but of the success attending it there can be little doubt. But it must be done with great care, and with the point of a sharp-pointed knife, so as not to injure those that are left. The reason for thinning the buds at this early stage is to throw more of the strength of the trees into those that are left, and thus to enable them to form their parts completely. It is often observed that when there is the greatest show of blossoms, there is the less fruit, the tree having exhausted itself in their production, and many of them being abortive.

The trees must be excited slowly and gradually until they have set their fruit, and air must be admitted upon all possible occasions, both for giving strength to the blossom and also for causing the pollen to disperse from the anthers.

Too much water given at the time of setting, and until the fruit have stoned, is liable to make them fall off: after that time, they require it in greater abundance, but never to excess. During this period, also, the most uniform and moderate heat must be maintained. In this respect Abercrombie has laid down a very excellent rule, and one that has not yet been improved upon. He says: " Throughout the first week, let the minimum be forty degrees, and the maximum forty-two degrees, giving plenty of air. By gradual advances in the second, third, and fourth weeks, raise the course to forty-two degrees minimum, and forty-five degrees maximum. In strong sunshine, admit air freely, rather than have the temperature above fifty-two degrees, by collecting the warm air. In the fifth and sixth weeks the artificial minimum may be gradually elevated to forty-five degrees, but the maximum should be restricted to forty-eight degrees from fire-heat, and to fifty-five degrees from sun-heat, until the plants are in flower. After the blossoms are shown, and until the fruit is set, aim to have the heat from the flues at forty-eight degrees minimum, and fifty-two degrees maximum. At this stage maintain as free an interchange of air as the weather will permit; and, when the sun-heat is strong, do not let the temperature within exceed sixty degrees. As the fruit is to be swelled and ripened, the requisite heat is sixty degrees minimum, and sixty-five degrees maximum."

Cherries are very successfully forced in the gardens at Hampton Court, by our friend A. Turrell, Esq., in a house in which the trees are planted out and trained against gable-shaped trellises, one of which is placed under each rafter; but, although the trees are planted against such trellisses, and also against the back wall, much attention is not paid to fastening them very closely to these supports, many of the branches towards the top being allowed to grow out a foot or eighteen inches from the trellis; but upon these shoots the finest fruit are produced. Cherries are also forced in the same gardens most successfully, planted in pots, in the usual manner.

Our objection to Cherries being planted out permanently in a house of this description is, that no other use can be made of it at any other period of the year; and, should two or more trees fail, the loss of space, fuel, and labour, would be considerable: whereas, were the trees planted in pots, and a few of them should fail to blossom or set their fruit, their places could be supplied from the collection in reserve: indeed, two crops might be annually taken out of the house, instead of one; and, were vines planted in front (outside), they could be introduced and trained up the rafters, and so produce a late crop of grapes, after the Cherries had been gathered.

The late Mr. Torbron, long assistant in the forcing gardens at Kew, and afterwards gardener at Ashbridge Park, recommends an economical mode of forcing the Cherry, which, now that the hot-water system of heating is so well understood, might be carried on to a considerable extent in any garden, and which is applicable not only to the Cherry, but to the plum, apricot, and fig. His paper, in the *Trans. of the Hort. Soc.*, is to the following effect:—" Where a portion of wall (especially with a southern aspect), already well furnished with May-Dukes, perfectly established, and in a bearing state, can be spared for forcing, a temporary glass-case may be put up against it; the flue [or hot-water pipes] may be built on the surface of the border, without digging, or sinking for a foundation; neither will any upright glass or front-wall be requisite: the wooden plate on which the lower ends of the rafters are to rest may be supported by piles, sunk or driven into the soil of the border, one pile under every, or every alternate rafter. The space between the plate and the surface of the border should be filled with boards nailed against the piles, to exclude the external air; for the plate must be elevated above the level of the surface from eighteen to thirty inches, or whatever height may be sufficient to let the sashes slip down, in order to admit fresh air." Such a structure as this is within the means of most people who have a garden; and the sashes used for forwarding a crop of cherries, plums, or apricots, may be used also for ripening late peaches or grapes, in unfavourable seasons.

Cherries subjected to be grown in pots, and forced, will, of course, in a few years, become worn out; but this is a matter of little consequence, as better trees can always be purchased in the nurseries at less cost and trouble than any species of renovation that can be practised upon them. Mr. Robert Thompson very justly remarks, in a note of communication to Mr. Loudon, that " the circumstance of forced Cherry-trees making little wood renders it expedient that pruning should be resorted to, in order to produce a moderate quantity of young shoots and healthy leaves, to generate sap, and induce fresh vigour in the tree." This is perfectly correct, and would be absolutely necessary, were there any difficulty in procuring a fresh supply when required; but we think it better to force the trees while they produce good crops, and afterwards to replace them with new ones.

THE CHESTNUT.

The Chestnut, in all probability, was introduced into this country by the Romans, and they themselves received it from the Greeks, to whom it was well known more than five hundred years before Christ. Of all the fruit-trees introduced into Britain by that people, the Chestnut is perhaps the only one that has kept its place after their departure; and so completely does it appear to have established itself, that Dr. Ducarel and others have set it down as being indigenous. The above historian, in his Anglo-Norman Antiquities, reasoning from the many old buildings in London and other ancient cities, in which this wood is said to be found, and also from a deed of gift from Henry II., who granted to Flexley Abbey the tithe of all his chestnuts in the Forest of Dean,—thinks it unquestionably of British origin: but the circumstance of its not ripening its fruit in all seasons, added to the few instances that can be adduced of its being found in situations which have not, more or less, the appearance of cultivation, as well as the limited number existing prior to the beginning of the last century, leaves little doubt on our minds but that it is of exotic extraction; and it is more than probable that the timber stated to have been found in old buildings, that of Westminster Hall, for example, is not chestnut at all, but oak of very fine grain. This appears to have been the opinion of Daines Barrington, Professor Martyn, and others of equally high authority.

The Great Chestnut of Tortworth, in Gloucestershire, fifty-two feet in circumference, is one of the most magnificent vegetable remains of which this country can boast, and is reasonably calculated to have stood there since before the Norman Conquest. This tree, great however although it be, sinks into comparative insignificance, when compared with "*the Chestnut of one hundred horses*," as that immense one is called which exists on Mount Ætna, and which is said, by Mr. Brydone, to be two hundred and four feet in circumference.

The Chestnut was much used in the time of Pliny as an article of food, being ground into meal and made into bread; nor was the art of grafting it to improve its qualities unknown at that early period. In the Apennine mountains of Italy, in Savoy, and in many parts of the south of France, Chestnut not only forms a considerable portion of the food of the poor, but it enters into the puddings, cakes, and made-dishes of the rich. We are apt to consider the fruit unwholesome, and hard of digestion; but there are instances in Italy of persons living to nearly one hundred years who have fed wholly upon it.

The Chestnut is much more cultivated in Britain as an ornamental or timber tree than for the sake of its fruit, which ripens only in the best seasons, and in the most favourable situations. There are varieties, however, even growing in our woods, that produce much superior fruit to others; and the late Mr. Knight and others have made selections which they have recommended to be perpetuated by grafting, on account of the superiority of their fruit.

The medicinal properties of this tree do not rank high, but its uses in the arts are numerous and important. The bark and the chips of the wood are used for tanning and dyeing, and the timber possesses all the properties of the oak, with this advantage, that young sapling trees may be used to greater advantage, where durability is required, than oak of much older growth.

The varieties planted in the gardens of the London Hort. Soc. have not as yet produced fruit, so as to enable Mr. Thompson to regulate their nomenclature with any degree of certainty. It is only conjecture, therefore, whether they may ever become entitled to rank as a fruit-garden tree in this country or not.

THE CRANBERRY.

THE Cranberry belongs to an extensive but much neglected genus of plants, chiefly natives of North America, although some are indigenous to the British islands, and perhaps better known wild than in a state of cultivation. They formerly all belonged to the genus *Vaccinium*, and the Scotch Cranberry, *Vaccinium vitis idæa*, still ranks under that head. Botanical investigation, however, has seen the propriety of separating the other two, and constituting a new genus, viz., that of *Oxycoccus*, in which are placed the American Cranberry, *Oxycoccus macrocarpus*, and the common Cranberry, *Oxycoccus palustris*.

The cultivation of the American Cranberry, which is the sort most in esteem, is comparatively of modern date. The late Sir Joseph Banks, we believe, was the first who directed attention to this subject, and in his garden at Spring Grove, succeeded in fruiting it admirably. A detail of his practice is to be found in the *Hort. Trans.*, vol. i. p. 71. Other details respecting the culture of this fruit may be found in vol. ii. p. 97, vol. iv. p. 483, vol. v. p. 279, of the work last quoted, and also in vol. i. p. 151, of the Gardener's Magazine. We may here briefly remark, that the cultivation of the Cranberry is exceedingly simple, and that it may be grown in great quantities in *peat soil*, either in a dry exposed situation, or in a moist and partially irrigated border.

The *Vaccinium madeirense* of Link, *V. Arcotostaphylos* of Andrews, or *padifolium* of Smith, is a valuable species, and although a native of Madeira, succeeds well with us in the open borders of the flower garden, planted in a peat soil. Unlike those above noticed, which are of procumbent growth, this latter attains a height of two or three feet, and produces immense quantities of fruit, and which are of excellent quality, either for the dessert, or for pies and tarts. We purchased twelve plants in 1829, from the late proprietors of the Fulham nursery, who then had the best collection of the genus *Vaccinium* of any other establishment round London. These plants produced fruit in 1830, and since that time have annually continued to afford an abundant supply, until this season, 1838, when they have been cut down to the ground by the frost, but are springing up again very strongly from the roots.

THE CUCUMBER.

The Cucumber is evidently a native of a warm climate, most probably some part of Asia or Africa: it certainly is not indigenous to Europe, and its cultivation and use were known long before the discovery of America. It is of nearly as ancient a date as the vine, and is mentioned by Moses, in the Book of Numbers, above 3000 years ago, as abounding in Egypt, and we find their loss to be one cause of the murmurings of the Israelites while in the Wilderness. The cultivation of the Cucumber is particularly noticed by the earliest Greek writers on plants, who particularly recommended that the seeds should be steeped for two days in milk and honey before they are set, which they asserted made the fruit sweeter and pleasanter: similar opinions have been held at a much more recent date, and were even believed in by the great Lord Bacon. Pliny mentions the Cucumber as being common in Africa in his time, and recommended its being boiled and peeled, and eaten with oil, vinegar, and honey. The Emperor Tiberius, the same historian relates, was so fond of them, that they were served at his table every day of the year. "The beds and gardens wherein they grew were made upon frames, so as to be removed every day with wheels: and in winter, during the cold and frosty days, they could be drawn back into certain high, covered buildings, exposed to the sun, and there housed under roof."—*Phillips.* Columella also directs them to be forwarded by artificial means. "Those who wish for them early," says he, "should plant the seeds in well-dunged earth, put into osier baskets, that they may be carried out of the house, and placed in warm situations when the weather permits, and as soon as the season is advanced, the plants may be sunk in the earth with the baskets, or wheels may be put upon large vases, that they may be brought out with less labour."—*Idem.* Similar simple means were employed by our own earlier gardeners. From the above, and also from an observation of Columella, of their being covered with *specularia*, probably talc, or some transparent mineral which the Romans knew how to split into thin laminæ, so that light might be transmitted through it, as well as from the knowledge they had of heating apartments by flues, we are led to the belief that this fruit was pretty extensively forced during the days of Roman splendour. The date of its introduction into Britain is not certainly known; in *Gough's British Topography* it is stated to have been common in the reign of Edward III.; it was lost during the wars of the houses of York and Lancaster, but was again reintroduced in the time of Henry VIII.

Gerard appears to have been the first who gave directions for the cultivation of the Cucumber. He says they should be covered with mats over hoops, as glass was not then known. Lord Bacon has given pretty copious directions on the same subject, but they are not of much value. In Miller's Dictionary it is recorded that Fowler, gardener to Sir N. Gould, at Stoke Newington, presented a brace of cucumbers to George I. on New Year's Day, 1721, perhaps the first produced in this country at so early a season. Cucumbers are even now much prized at that early period of the year, and hence—

> "To raise the prickly and green-coated gourd,
> So gratefull to the palate; and when rare,
> So coveted: else base and disesteemed,
> Food for the vulgar meerly."

The medicinal properties of this fruit were believed to be much greater formerly than at present: they are too cold for most stomachs, and produce flatulency, diarrhœa, and sometimes even cholera, in others. Brooks states them to be unfit for nourishment, while Murrell, of Berlin, asserts that he cured a gentleman of a dangerous consumption by keeping him some weeks on cucumbers, which he eat raw, and without any other sustenance except a few biscuits and water. The *Elaterium* so highly spoken of by Theophrastus, was prepared from the juice of this fruit. For its medicinal properties, see *Medical Botany*, art. *Cucumber*.

"The Romans had many superstitious notions respecting the wild cucumber. Wives who wished for children wore them tied round their bodies: and they were brought into houses by the midwife, but carried out in the greatest haste after child-birth."—*Phillips*.

The young shoots of the Cucumber, when boiled, form a very excellent substitute for greens, as do also the young shoots of all the varieties of gourds and pumpkins whose fruits are eatable. This may at first sight appear an extravagant substitute; but, when we consider how rapidly they nd the bulk of vegetable matter produced, we think the fact worth g, as we believe it is not generally known.

TIES.—Abercrombie recommends the short prickly and the long Nicol, the early short prickly, the early smooth green, the long green prickly, and the white prickly. Lindley, the early frame, early Southgate, long prickly, short prickly, green turkey, white turkey, white spined, and the Patagonian. To these might be added a long list of names; but to attempt any thing like a satisfactory description of them would be impossible, as so much depends upon the manner of cultivating them; and the facility with which they become hybridized, either naturally or by art, renders them so subject to change, that, without the greatest care to prevent cross-impregnation, it is hardly to be calculated that a variety will maintain its character unchanged for a year or two. Almost every gardener has his favourite sort of cucumber, and endeavours to preserve it as true to its kind as possible, by seldom growing any other sort, at least in the same frame or pit.

Instead, therefore, of attempting a descriptive list of sorts, we will at once proceed to their culture; first, as grown in the open air; and, next, as produced by artificial means at an earlier period of the season.

PROPAGATION OF THE CUCUMBER.

The Cucumber is propagated principally by seeds, and occasionally by cuttings, and may, for curiosity or experiment, be grafted upon itself; that is, one variety may be grafted upon another.

UNDER HAND GLASSES.—M'Phail, one of our best practical writers, gives the following as his practice; and, as it differs in few respects from that followed by the best gardeners of the present day, we will give it in his own words:—" The seeds are sown some time about the middle of April in a cucumber or melon bed, and when they come up, they are potted out into small pots, two or three plants in each pot, and are kept properly watered, and stopped at the first and second joints. About the middle of May, a warm situation, where the mould is very rich, is pitched on, and a trench is dug out about two feet deep, three feet broad, and the length is proportioned according to the number of glasses it is intended for. This trench is filled with good warm dung; and when the dung has come to its full heat, it is covered over with eight, ten, or twelve inches deep of rich mould. The glasses are then set upon it, about three feet distant from each other; and when the mould gets warm under them, the plants are turned out of their pots with their balls whole, and plunged in the mould under the glasses, and a little water given to settle the mould about the roots, the glasses set over them, and after they have made roots, and begin to grow, in fine days the glasses are raised a little on one side to let the plants have the free air; and, as the weather gets warmer and warmer, air is given more plentifully, to harden [rather, to strengthen] the plants, so that they may be able to bear the open air. When the plants begin to fill the glasses, they are trained out horizontally, and the glasses are set upon bricks, or such-like, to bear them from the plants. After this the plants require nothing more but to be supplied with water, when the summer showers are not sufficient, and to stop them when they run too thin of branches, and thin them of leaves or branches when they are likely to become over-crowded. In warm summers, and in warm situations, by this mode of management, the plants will bear plentifully for about two months, provided they be not attacked by insects, or weakened by disease." For the last crop, in the open air, Lindley recommends to sow the seeds under the glasses in May or June: he says, "It is a great advantage to the crop in the open air to cover the ridges with clean straw or peas-haulm, where the plants are grown long enough to train upon the ridges. This will serve to keep the sun from parching the ground in hot dry weather, and to prevent the blossoms and young fruit from being covered with soil during heavy rains. The covering of the ridges with straw or haulm has another advantage,—that of preventing, in a great measure, the fruit from becoming spotted when the autumn is wet or cold: the thickness of their coverings should not be less than tw. inches, when pressed close to the ground."

FORCING.—Much of what will hereafter be directed with respect to forcing melons, is applicable to the Cucumber also: we will, therefore, to avoid repetition, confine our present observations entirely to those parts of culture wherein the difference of treatment consists.

The Cucumber is not only brought much earlier to perfection than the melon, but it is in many cases kept in bearing throughout the whole year. To effect this at the least expense, and with the greatest possible certainty, ought to be a consideration; and therefore, when the cultivator has the convenience of pine stoves, the winter and early spring crops of cucumbers ought to be produced in them; for, although they are in many cases produced upon common dung beds, and in pits of various kinds heated by dung, still, however successful the cultivator may be, it cannot be denied but that the crop is produced at greater expense, and with much less certainty, than when grown in a well-regulated stove. To such, however, as are ambitious to have a supply of this fruit during winter, and who may not have a stove, a small pit, heated by hot water, will be found the best substitute, and in both cases we would recommend the vines (as branches or shoots of the Cucumber are called) to be trained to a trellis, so that the fruit may hang in a pendant manner, which not only tends to make it grow straight, but also prevents it being injured by damp.

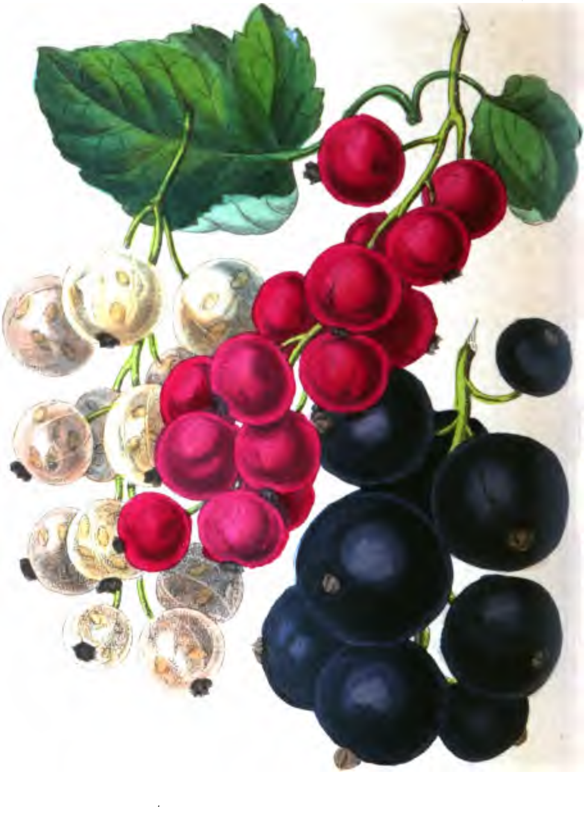
Plants for this mode of forcing are either originated from seeds sown in August, or from cuttings taken off at the same time. In the former case the seeds are sown in the usual manner, and when the plants have made their seed-leaves they are transplanted into pots of the size called upright thirty-twos, two plants into each pot. These are to be plunged in a moist, warm, dung bed; and when they have filled the pots with roots they are to be shifted into others of a larger size. At this stage of their growth, care must be taken to keep them in a free-growing state, and also to admit abundance of air to them to straighten them; for, if drawn up slender at this time, little success will attend their after-growth. Towards the middle of September they will be fit to remove into the stove, to be planted into pots fourteen inches in diameter, and twelve or thirteen inches in depth. These must be well drained, and filled with mould for their reception, and placed upon the top of the back flue, if there be one, and if not, upon some elevated situation, so that the plants may be as near the glass as possible, and thus enjoy all the light and sun that the short days of winter will afford. Some cultivators have boxes in their pine stoves on purpose for cucumbers, and these, being usually larger than pots, and less acted upon by the heat, are no doubt preferable. Others place their pots upon a strong shelf, having a fascia-boarding in front, which forms a long trough, in which mould is placed, and into which the roots of the plants run when they have escaped from the pots, by the holes in the bottom and sides. Into these the young plants are set, and as they extend are trained to the trellis under the glass, being stopped to cause them to send out lateral fruit-bearing shoots, which as they flower are carefully impregnated, and managed exactly in the same manner as if they were growing in common frames. The temperature kept up by artificial heat is from sixty to sixty-five or sixty-seven degrees. They must be regularly supplied with water at their roots, and frequently sprinkled over their leaves, particularly in the mornings and evenings, which, with the proper degree of humidity maintained in the stove, will be quite sufficient for the healthy production of the Cucumber.

In propagating plants for this mode of culture by cuttings, it will be necessary to begin in August: the tops of the bearing shoots should be chosen, and planted in pots nine inches deep, but only half-filled with mould, and plunged into a mild bottom heat. The sides of the pots act as a sufficient shade, and a piece of glass laid over their mouths serves for a bell-glass to exclude the air. In a fortnight the plants are sufficiently rooted to enable them to be transplanted into pots of the ordinary size; after which their whole treatment does not differ from that of plants originated from seeds, as noticed above. The mode laid down by M'Phail, and practised by most gardeners, even of the present day, is then to be followed; namely, to take a shoot that is just ready for stopping, cut it off just below the joint, behind the joint before which the shoot should have been stopped; then cut smooth the lower end of the shoot or cutting, and stick it into leaf or other fine rich mould, about an inch deep; give it plenty of heat, and shade it from the rays of the sun till it be fairly struck." Cucumbers may also be continued by laying, and the end and object of both laying and striking by cuttings is to produce plants less succulent, and therefore less liable to damp off, or suffer from the low temperature they may be exposed to during the winter; they also grow less luxuriantly, sometimes bearing sooner, and are considered to be more productive than plants raised from seeds.

In training the Cucumber in stoves, when the pots or boxes are placed near the roof, and close to the back-wall, it follows that the vines will be trained downwards; but this, it should be remarked, is rather an advantage than otherwise, as the sap is moderated in its circulation, and less likely to produce over-luxuriant and unfruitful plants.

Cucumbers have been produced throughout the winter by growing them on a common dung hot-bed, placed within a vinery, the vines being taken out and trained to the rafters, or to stakes placed in the border on purpose. The plants ought to be brought forward in a frame, and frequently shifted into larger pots, so as to be fit to ridge out in October, when the crop of grapes is cut, and at which time the vines may be removed. The advantage of this plan is the economy of dung, and the greater command of a steady and sufficient heat; the whole being not only protected from cold, rain, and winds, by the glass covering, but should the temperature in the dung bed decline, or the weather become suddenly cold, a slight fire in the flues will counteract its effects; and a sufficient heat can at any time be thrown into the vinery, to enable the cultivator to prune, regulate, or order his plants to his mind, which he can seldom do when the plants are in the open air. The glass both of the frame, and also of the house immediately over it, should be kept perfectly clean, so as to admit as much light as possible, and the bed should be elevated, so that its glass may be near the roof of the house, for a similar reason.

CURRANTS.



Dutch White. Dutch Red. - Black Naples.

THE CURRANT.

Both the Black and Red Currant are indigenous to Britain, as well as to most parts of Europe, especially the northern parts. In the woods in Russia, and the sub-alpine parts of Siberia, both abound, and the fruit in both countries are very large and sapid. In Britain they are found in damp hedge-banks and woods, particularly in Durham, Yorkshire, and Westmorland, as well as in many parts of Scotland. The Black Currant (*Ribes nigrum*), is a distinct species from the Red (*Ribes rubrum*): the White and Champagne are only varieties of the latter, the first supposed to have been accidentally produced by culture, and the latter evidently a hybrid between the red and white varieties. The late Professor Martin observes that, "the Currant does not seem to have been known to the ancient Greeks and Romans, as the southern nations of Europe have not even an appropriate name for it at this day. The old French name, *groseilles d'outre mer*, proclaims their having been strangers imported. Our English name of Currant is evidently from the similitude of the fruit to that of the *Uva corinthiaca*, the small grape of Zante, or the common grocer's corinths, or currants." Neither do the Dutch claim it as a native of Holland, although to the gardeners of that country we are indebted for bringing it to that high degree of cultivation, which the varieties in our gardens at this time present.

In Italy the fruit is still called *uvette, a little grape*, and at Geneva, *raisins de Mars*. Tusser takes no notice of them in his time, and Gerard considered them as a kind of gooseberry, if we are to understand from the following allusion that he meant them, when describing the gooseberry :—" We have also," says he, " in our London gardens another sort altogether, without prickles, whose fruit is very small, lesser by much than the common kind, but of a perfect red colour, wherein it differeth from the rest of its kind."

Bacon is the first British author who distinctly notices them by name: —" The earliest fruits are strawberries, gooseberries, *corrans*, and after them early apples, early pears, &c. ;" and Worlidge, in his *Vinetum Britannicum*, published in 1675, says, " The English *curran*, once in esteem, but now cast out of all good gardens, as is the Black, which was never worth any thing. The white curran became native to our soil, which is also improved in some rich, moist grounds, that it hath gained a higher name of the greatest red Dutch curran. These are the only fruits that are fit to be planted and propagated for wine."

The medicinal properties of the Currant are similar to those of most other sub-acid fruits, allaying thirst, lessening the secretion of the bile, and correcting a scorbutic state of the fluids.

VARIETIES.—The Black, Red, White, and afterwards the Champagne, are the only varieties noticed till of late years. Lindley describes six sorts, and the Fruit Catalogue of the Hort. Soc. enumerates fourteen, of which the following are considered the best :—

SELECT LIST OF CURRANTS.

1. Common Black.—Too well known to require any particular description here.
2. Black Naples.—The superiority of this consists, not only in the larger size of the fruit, but in the clusters being more numerous on the bushes, as well as in each cluster bearing a greater number of berries.
3. Large Red. [*Syn.*, Red Dutch.]—Of the red currant there are in many old gardens some very inferior varieties to be met with, which should be rooted up.
4. White Dutch, with yellowish fruit and foot stalks.
5. White Crystal, with white fruit and large bunches.
6. Champagne. [*Syn.*, Pheasant's Eye.]—A pale, red fruited sort, evidently a hybrid between the red and white kinds.

PROPAGATION OF THE CURRANT.

The Currant is capable of being multiplied by seeds, cuttings, layers, and by grafting one sort on another.

SEEDS.—This mode of propagation is only had recourse to when the intention is to originate or procure new or improved varieties, and has been carried on to a pretty considerable extent by that late eminent horticulturist, T. A. Knight, Esq., the routine of whose practice is thus given in the *Transactions of the London Hort. Soc.*, vol. iii. Mr. Knight "procured cuttings in the year 1810, of the finest varieties of the red and white currant, which he planted in pots of very rich mould, and placed under a south wall, to which the trees were subsequently trained. At the end of three years, within which period the pots had been as often changed, the trees were first suffered to produce blossoms. These were, with the exception of a very small number, removed from the white currant trees as soon as their buds unfolded, and those which remained were deprived of their stamens whilst immature, and subsequently fertilized by the pollen of the red varieties. The seeds thus obtained were sown in pots as soon as the fruit had become perfectly mature, and were subjected early in the ensuing spring to the artificial heat of a forcing-house; by which means, and by proper subsequent attention, the plants grew more than a foot in height the first season. At two years of age, in the year 1816, several of the plants, and in 1817, the greater part of them, produced fruit of a great variety of character and merit; but out of about two hundred varieties, only three red and two white appeared to possess greater merits than their parents." It would therefore appear that the chances of obtaining new or improved varieties are rather rare, and this may account for the few varieties that have hitherto appeared.

Cuttings.—This is the most usual and certainly the best mode of increasing this shrub:—"For this purpose," says Lindley, "strong, vigorous shoots should be selected, which are straight, and about twelve inches of the lowest part made use of. The eyes from six to eight inches of each cutting should be cut out previous to planting, which will prevent suckers from being thrown up from the roots. When they have been two years in the nursery bed, and have formed heads of four or five shoots, they may be planted where they are intended to remain, taking care to have a stem of eight inches clear above ground, to each plant." The season for planting cuttings is in October or November, when they should be placed in a shady border, in rows, crossways, allowing ten or twelve inches between row and row, and inserting each cutting about half way into the mould. It is scarcely necessary to observe, that the young wood only should be used.

Suckers.—The suckers which spring up from about the root, when carefully taken up and planted in nursery lines for a season, to be modelled into proper shape by pruning, &c., will make pretty good plants; the only advantage, however, is the gain of one season; but they never make such handsome plants as those originated from cuttings, and they are liable to send up suckers, and a profusion of useless wood, ever afterwards.

Grafting.—This mode of propagation is only occasionally used, when the cultivator wishes to have different kinds of currants growing on the same tree.

Layers.—The Currant was formerly sometimes increased in this way, but modern practice has almost discontinued it. "When the trees are cut low," says Forsyth, "you may lay down some of the branches either in winter or spring, when the ground in the quarters or rows is dry, which should always be done annually. In the autumn following these layers will have made fine roots: you may then plant them out where you wish them to stand, and they will bear fine fruit the following summer."

Soil.—All the sorts will grow in almost any soil or situation. In open, warm, and sunny places, the fruit will ripen early in June, and in shaded and northern aspects much later, and in such the fruit may be retained on the trees till destroyed by the frost. The Black Currant prefers a damp, rich, strong loam, and rather shaded situation; but any good garden mould will be suitable for all.

Planting.—The season for planting extends from October till March. Plants intended to bear the following year had better be planted early in autumn. They are usually planted in lines by the sides of walks, in quarters by themselves, or against pieces of unoccupied walls, or even on espaliers. They should be allowed from five to ten feet distance, according to circumstances.

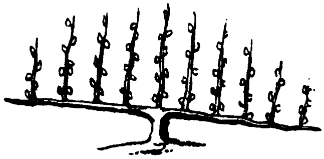
Pruning and training Standards.—The season of pruning and training, like that of planting, extends from October till March, for what is called winter pruning; but the best cultivators deem it necessary to give them what is called a summer pruning also, which latter is performed during May and June; and, if judiciously done, facilitates the operation of winter pruning very much, as well as improves the size, flavour, and ripening of the fruit.

In regard to winter pruning, Abercrombie prefers the mode called *long pruning*, and so do most modern cultivators, who wish for an increase in the size of the fruit; while many others, and the London market-gardeners generally, adopt the *short*, or spur method. The former is thus described by the above author:—"In pruning these shrubs it will be necessary to observe, that their branches should be kept thin, and at regular distances. The heart of the tree should be open, and clear of wood, so as to admit the sun and air in summer to the fruit, and the branches no where suffered to cross one another. Numbers of young shoots are produced every summer, many of which should now (*i. e.* October) be cut out," (that is, in cases where a proper summer pruning has not taken place); " but, in doing this, occasionally here and there leave one or more of the best placed and most regular grown of the said shoots towards the lower parts of the trees, but particularly in places where there is a vacancy; or for a succession of young bearing wood, to supply the places of such branches as are grown too long or straggling, and such branches as are worn out, or become past bearing good fruit, which should be entirely removed or cut shorter, in order to make proper room for such young shoots as promise to produce the best fruit. All such shoots as are not wanted must be cut close to the branches. The shoots and branches, in general, should stand, at their extremity, eight or nine inches distant from one another."

As almost every branch will have produced three, four, or more of the said young shoots last summer; that is, one at the end, and the rest placed under another, lower on the branch, you are to observe that, except in vacancies, it is not necessary to leave more than one or two of these young shoots on each of the general branches; one of which must be left so as to terminate, and be a leader for the branch, and the others only left below in vacancies, or, if not wanted, cut quite out. Let it be observed, in pruning these shrubs, that the summer shoots should be very little shortened. Some cut the shoots very short, but that is wrong, for it causes the trees to produce numberless useless shoots next summer, to the great prejudice of the fruit. To avoid this, let the shoots be always shortened with discretion: never cut more off an ordinary shoot than about one-third of its length, and about one-fourth off a vigorous shoot. But this shortening should not be general, but practised occasionally; for instance, if the shoot advance much beyond the rest, or if it turn its end down to the ground, as gooseberries often do.

The spur method of pruning is thus described in the English Gardener: —" When the young currant-tree is planted out, it ought not to be suffered to have any limbs within five or six inches of the ground, but should be made to have a clear and straight trunk to that height. When the limbs come out, or rather the shoots that are to become limbs, there should not be more than four or six suffered to go on as principal limbs. By shortening the shoots at the end of the first year, you double the number of limbs. These are to be kept constantly clear of side-shoots, by cutting off every winter the last summer's wood, within one bud or two of the limb; and when the limbs have attained their proper length, the shoot at the end of each limb should also be annually cut off, so that the tree, when it has received its pruning, consists of a certain number of limbs, looking like so many ragged sticks, with bunches of spurs sticking out of them: on these spurs comes the fruit in prodigious quantities. If you neglect to prune in the manner here directed, the centre of the tree becomes crowded with wood, and the small quantity of wood that comes near the point of the limbs is very poor and small. This method of pruning currants is amongst the very greatest improvements in gardening, and is a discovery," according to the late Mr. Cobbett, "to be ascribed solely to the market gardeners in the neighbourhood of London, like a great many other things in the art of gardening, in which they far excel all the rest of the world." Currant bushes trained and pruned in this way occupy little space, and therefore admit of the ground between the rows being cultivated with other crops. In pruning Black Currants the long method of pruning is to be preferred, as they in general produce the best fruit on the young wood of the preceding season's growth. Less dependence, therefore, should be placed on spurs: a portion of the old wood should annually be cut out to allow room for the young wood to come in in successional order.

In training Currants against walls it appears to be the most convenient mode to lead two branches from the stem, in a horizontal direction, about six or eight inches from the ground, in opposite directions; from these shoots will arise at about six or eight inches apart, which should then be trained to the wall in a perpendicular manner, as in the annexed woodcut.



Summer pruning the Currant is of vast importance to the fruit, and should be much more generally attended to than it is at present, or ever has been: it chiefly consists in entirely removing all ill-placed, luxuriant, and useless young shoots, as well as twisting off any root-suckers that may arise, and also in shortening all other young shoots to a few inches in length, except the terminal or leading ones, or such as may be required for filling up any vacancy likely to occur in the tree, or otherwise wanted.

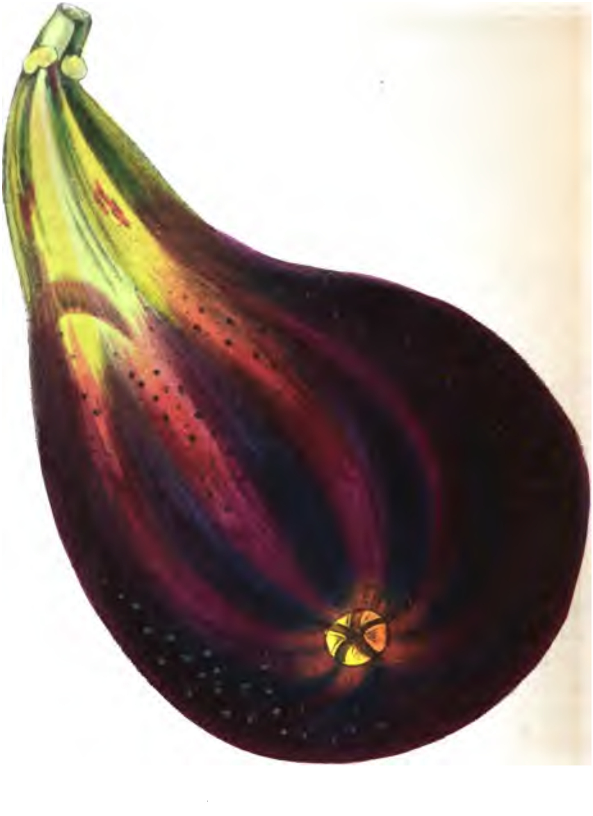
INSECTS INJURIOUS TO THE CURRANT.—The Black Currant is seldom attacked by insects, but the leaves of the Red and White varieties are often greatly injured by the caterpillar of the gooseberry-moth *(Abraxas grossulariata)*, the *Aphis ribes*, the larva of the *Ægeria tipuliformis*, or currant clear-winged sphinx; and the fruit is apt to be destroyed by earwigs, and also by birds of various species. The attacks of the first must be combated by hand-picking, or the use of caustic lime-water. The second small, but numerous enemy, attacks the tips of the shoots and the young leaves, which it perforates in thousands of holes, and causes them to contract and turn red, and finally to drop off altogether; by which the fruit is left without shade or nourishment, and consequently never attains its full perfection. Hot-water, lime, and fumigation, have been recommended, and each are to a certain extent beneficial, and so is a judicious summer-pruning, which removes the insects by thousands. The leaves, when affected with this species of aphides, become covered with a sweetish, glutinous kind of substance, known by the familiar name of honey-dew. The insect appears, to Towers, "to be enticed by the saccharine process which is induced by frosts, after the first expansion of the leaves; the juice is thereby rendered sweet, the leaves become the prey of the aphides, and these, in their turn, deposit a saccharine, honey-like, excrementicious substance, which is known as the honey-dew." It does not appear that any very effectual remedy has been discovered for the destruction of the currant clear-winged sphinx, which perforates the branches down to the pith, and thereby causes great debility in the tree, and a consequent dimininution in the size of the fruit. Bean-stalks, cut into short lengths, and hung up in the bushes in little bundles, is a good trap for the earwigs, who take shelter in the cavities, or are attracted into them by the sweetness in the inside of the bean-stalks, from whence they can be readily dislodged by being shaken into a pailful of water.—*(See* GOOSEBERRY.)

PROTECTING AND COVERING UP THE FRUIT.—The fruit of the red and white Currant may be preserved on the bushes till near Christmas, if the winter is mild. For this purpose the trees should be planted against north aspect walls, and when ripe should be covered with thin bunting, mats, or double nets, to exclude the birds; and such bushes as are growing as standards may be also protected, by being covered with the same materials. Black currants do not keep well on the trees after they are fully ripe; they are both liable to rot, and also to drop off the stalks.

FORCING.—This is seldom attempted, at least in this country; few fruits are, however, more easily produced by artificial means than this. In the spring previous to the season they are to be forced, some well-grown three or four-year old bushes should be taken up, and planted in large pots, or small tubs, and afterwards plunged into a bed of coal-ashes, rotten tan, or similar matter, and plentifully supplied during summer with water; and, as the fruit sets upon them, it should be cut off with a pair of fine-pointed scissors. The November, December, or January following, according to the time the ripe fruit may be most desired, they should be removed into the peach-house or cherry-house, either of which structures is adapted to the purpose; and, as the treatment of the trees within them agrees in all respects with that required for the Currant, little else is required than a moderate degree of heat, water, and air (for which, see *Forcing Cherries.)*

Abraxas grossulariata, or Gooseberry Moth.

FIG



Brunswick.

THE FIG.

The Fig is one of the oldest fruits known to man, and indeed it appears to have been, with the apple and the grape, his principal sustenance, if not before, at least immediately after his fall. The leaves were employed by our first parents as a covering before their expulsion from Paradise, and the Israelites brought the fruit of it from Canaan, as a sample of the produce of that promised land. Again, Abigail presented David with two hundred cakes of figs, to appease him for the affront given by her husband Nabal. From all of which we may conclude that the Fig formed a very considerable portion of the food of the Syrian and neighbouring nations of old, as it does at this day in climates favourable to its production. We find the Fig admitted by Lycurgus as an article of food, even when he had banished luxury from Sparta; and so choice were the Athenians of their figs, that they were forbidden to export them from Attica, and "those who gave information of this fruit being sold contrary to law were called *sykophantai*, from two Greek words, signifying 'the discoverers of figs;' and as they sometimes gave malicious information, the term was afterwards applied to all informers, parasites, liars, flatterers, impostors, &c., from whence the word *sycophant* is derived."—*Phillips.*

" It was probably," says a late writer, " known to the people of the East before the Cerealia, and stood in the same relation to men living in the primitive condition of society as the banana does to the Indian tribes of South America at the present day. With little trouble or cultivation it supplied their necessities, and offered, not an article of occasional luxury, but of constant food, whether in a fresh or a dried state. As we proceed to a more advanced period of the history of the species, we find the Fig an object of general attention. The want of fruit-buds on the fig-tree was considered one of the most grievous calamities of the Jews;" and the mode of fructifying itself was long a subject of speculation to the scientific botanist. " There is something very singular in the fructification of the Fig: it has no visible flower, for the fruit arises immediately from the joints of the tree in the form of little buds, with a perforation at the end, but not opening or showing any thing like petals, or the ordinary parts of fructification. As the fig enlarges, the flower comes to maturity in concealment; and in the eastern countries the fruit is improved by a singular operation, known by the name of *caprification*. This is performed by suspending by threads, above the cultivated figs, branches of the wild fig, which are full of a species of cynips. When the insect has become winged it quits the wild fig, and penetrates the cultivated ones for the purpose of laying its eggs; and thus it appears both to ensure the fructification by dispersing the pollen, and afterwards to hasten the ripening by puncturing the pulp, and causing a change of the nutritious juices. In France this operation is imitated by inserting straws dipped in olive-oil."—*Lib. of Ent. Knowledge.*

The Fig was much admired by the Romans, who were possessed of no less than twenty-nine sorts prior to the Christian æra, all of which have been described by the naturalist Pliny. It is not at all improbable but that these people introduced this fruit into Britain, but that, owing to the utter ignorance of the Britons, and the severity of the winters, these trees must have perished. It was not known here in the time of Tusser; and Lord Bacon, who wrote at a still more recent date, does not mention the Fig in his list of fruits.

The earliest account we have of this tree as being cultivated in Britain is by Dr. Turner, in 1562, who gives an ample account of the virtues of the fruit in his Herbal, which he dedicated to Queen Elizabeth. Cardinal Pole is recorded, upon the best authority, as having introduced trees of it from Italy, in 1525, which he planted in the gardens of his palace at Lambeth, and which trees still exist. They suffered greatly from the frost of 1813-1814, but have since recovered, and are now again (in 1838) cut nearly to the ground.

Dr. Pocock introduced the fig-tree to the Oxford College Garden, from the East, in 1648, and of which tree the following anecdote is related:—Dr. Kennicott, the celebrated Hebrew scholar, and compiler of the Polyglot Bible, was passionately fond of this fruit, and, seeing a very fine fig on this tree that he wished to preserve, wrote on a label, "Dr. Kennicott's fig," which he tied to the fruit. An Oxonian wag, who had observed the transaction, watched the fruit daily, and, when ripe, gathered it, and exchanged the label for one thus worded—"a fig for Dr. Kennicott."

Gerard and Parkinson both speak of the Fig as a tender tree for this climate: the former recommends planting it against a hot-wall, and the latter says, if you plant it not against a brick-wall, it will not ripen kindly.

In the southern parts of England, particularly along the Sussex and Hampshire coasts, and in the opposite Isle of Wight, the Fig ripens well, when planted as open standard trees, many of which have attained a large size; and the fig orchards about Worthing produce a considerable revenue to their owners, and have been so abundant in some seasons as to have been made into wine, the crop far exceeding the usual demand for the fruit.

The wood of the fig-tree is considered almost indestructible, and is used, when charged with emery and oil, to polish iron and steel. "It is a curious fact, that fresh-killed venison, or any other animal food, being hung up in a fig-tree for a single night, will become as tender and as ready for dressing, as if kept for many days or weeks in the common manner."—*Phillips.*

VARIETIES.—Miller describes eighteen, and introduced about twelve new sorts from Italy; for up to his time the fruit was little known in Britain. He observes, that the generality of Englishmen are not lovers of this fruit, and that, therefore, few trouble themselves with the culture of it. Langley says, "the several kinds of figs that are worth cultivating in England are the white, the blue, and the black; Abercrombie describes eleven sorts; Forsyth describes fifteen sorts, and enumerates twelve others; Nicol enumerates four, and Neill, ten sorts. Rogers describes nine; Lindley, twenty-seven; and the Ency. of Gard., twenty-two sorts.

SELECT LIST OF FIGS.

1. **Black Ischia.**—All the figs under the name of Ischia were introduced from an Italian island of that name. Size, medium; form, round, rather compressed

towards the apex; colour, deep purple, almost black; pulp, deep red; flavour, excellent; ripens in August; habit, rather slender, very productive, and answers well to be grown in pots.

2. Black Italian, of Forsyth, and most other authorities, is perhaps nothing other than the above; at least, they are so much alike in every respect as not to deserve to be cultivated in the same garden as distinct sorts.

3. Black Genoa.—Size, medium; form, long, swelling much towards the apex, very slender next the stalk; colour, dark purple, almost black, covered with a fine purplish bloom; pulp, bright red; flavour, excellent; ripens in August; habit, moderately strong; an excellent bearer.

4. Brown Turkey. [*Syn.*, Brown Italian.]—Size, small; form, roundish; colour, brownish red or purple; pulp, reddish; flavour, good; ripens in August; habit, slender, well calculated for cultivating in pots, an abundant bearer.

5. Brunswick. [*Syn.*, Madonna, Hanover.]—Most probably from Italy, and was introduced by Miller under the name of Madonna, but changed to Brunswick and Hanover, on the accession of George I.; one of the most ridiculous and absurd tricks played off by nurserymen, and one which cannot be too severely censured, as having no good end, and tending greatly to add to the confusion which already too much exists in the nomenclature of fruits. Size, large; form, longish oval, with an oblique apex; colour, greenish on the shaded side, slightly tinged with dirty yellow, brownish red on the side next to the sun; pulp, whitish next the skin, pinkish red towards the centre; flavour, less rich than many others; ripens about the middle of August; habit, strong, hardy, producing large leaves. Rogers estimates its merits pretty accurately when he says:—"It is a rich and well-flavoured fruit, though too much extolled by one writer, who deems it super-excellent, and by another high authority depreciated far below its real merit. The fact is, that in this, as in many other matters, 'the truth lies between.' The tree is rather a shy bearer, but deserves a place in every garden, where, if trained on an east or west wall, and the branches kept at a good distance apart, the fruit will ripen well." We consider it to be one of the hardiest of figs; but, unless where there is abundance of room, there are others of the slender growing sorts which we would greatly prefer.

6. Chestnut. [*Syn.*, Chestnut-coloured Ischia, Brown's Ischia, Miller's Chestnut.]—Introduced from Ischia by Miller. Size, large; form, globular; colour, brown or chestnut; pulp, purplish red; flavour, excellent; ripens early in August; habit, hardy, and an excellent bearer; will, in favourable seasons, ripen its fruit on standards in the open air. It deserves a place against a hot wall, where it will in general produce two crops annually. It is not of too robust growth, therefore requiring little pruning, and suitable for growing in pots, and also bears forcing well. Its skin is thin and delicate; therefore, apt to crack or burst when ripe, particularly in wet seasons.

7. Green Ischia.—Introduced from Ischia. Size, medium; form, oblong, rather inclined to be globular at the apex; colour, green, but the skin is so thin, when fully ripe, that it is stained through by the pulp, which gives it a brownish cast; pulp, purple, and will stain paper or linen; flavour, excellent; ripens about the end of August; habit, moderate in growth, and good bearer.

8. Large Blue. [*Syn.*, Common Blue or Purple, Large Purple, Great Blue.]—Size, large; form, regular oblong; colour, dark brownish purple; pulp, deep

red; flavour, excellent; ripens in August; habit, a very hardy sort, and excellent bearer, well suited either for dwarf standards in the open air, or for forcing under glass. This sort bears carriage well, being firm in texture, and not subject to crack. The leaves are large; it should, therefore, be trained thinly, so as to admit the sun and air to the fruit. The laterals should be preserved, as they are the principal bearers.

9. Large White Genoa.—Rogers makes this and the Marseilles to be the same. Lindley's description, however, does not in any way agree; nor do our own notes, made some years ago, when we had an opportunity of comparing them together. Size, large; form, nearly round; colour, yellowish, when fully ripe; pulp, red; flavour, good; ripens about the end of August; habit, hardy, moderate in regard to luxuriance, and also a moderate bearer.

10. Marseilles. [*Syn.*, Pocock, White Marseilles, Early White Marseilles.]—Introduced from Italy by Cardinal Pole, in 1525. Size, small; form, nearly round, somewhat depressed; stalk, short and thick; colour, pale green, turning to yellow, when nearly ripe; pulp, white; flavour, excellent; ripens in August; habit, very hardy, and a good bearer in the open air, and also calculated for forcing, even in the highest temperatures.

11. Nerii.—Size, small; form, ovalish; colour, pale greenish yellow; pulp, pinkish red; flavour, much the richest of all figs; ripens in September; habit, rather delicate for the open air of this climate, but well calculated for moderate forcing. Comparatively little known in this country.

12. Pregussata.—Introduced a few years ago from the Ionian Isles, by Dr. Skey. Size, large; form, oblate; colour, purplish brown where shaded, dark brown next the sun; pulp, deep red; flavour, very rich and pleasant; ripens from August to October; habit, moderate in growth, a good bearer, and forces well.

The nomenclature of Figs is much less perfectly determined than that of any other fruit, nor are we altogether satisfied that the above list is exactly perfect. There are, for instance, two very excellent kinds in cultivation, which have escaped the notice of most authors; viz., Lee's Perpetual, and Lord Sidney's Fig; neither of which we can exactly identify with any of the above, if the former be not a seedling variety of the Large Blue, No. 8; and the latter of Nerii, No. 11. We have had both in cultivation in the Claremont Gardens, but recent reductions in the establishment have deprived us of the opportunity of describing them from the tree; and, on referring to some notes regarding them, drawn up some years ago, we find them less perfect than we could wish, and therefore must content ourselves by recommending both to the notice of fig cultivators.

PROPAGATION OF THE FIG.

The Fig may be increased by layers, cuttings, suckers, seeds, roots, and by grafting and budding. The three first modes are, however, the best; the fourth is practised only with a view to procure new or improved sorts, and the two last are employed only upon extraordinary occasions.

LAYERS.—This is the mode most generally employed in the best nurseries, and has the advantage in getting plants more quickly into a saleable state, as shoots two or three years old may be operated on, and will root freely the first summer, so as to admit of being taken off and planted where they are to remain in autumn.

CUTTINGS.—For this purpose the young wood of the preceding year's growth is selected, and that which is best ripened, short-jointed, and apparently the most fruitful, is chosen. These are cut to the length of about eight or ten inches, sometimes having a small piece of the old wood at their base, and at other times not. They should be cut from the trees in autumn, and laid in by the heels in the border of a peach-house, vinery, or in a warm shed where the frost cannot reach them, until spring, when they should be planted. Or they may be planted in autumn as soon as they are cut from the trees, in a warm, dry border, and covered over with haulm, fern, or similar light and dry covering, to protect them till spring. In planting fig cuttings in autumn the tops must not be then shortened, but be left till March, or the beginning of April. When the covering is removed in spring, they require little other trouble or care, excepting a due supply of water, and being kept clear of weeds, till the autumn following, when they will be fit to be transplanted into nursery rows, or to plant in pots, as may be required. Cuttings may also be readily struck if planted in pots, and placed under a frame, in a gentle heat, in March, and they will make good plants by the end of the year.

SUCKERS.—This is an expeditious and easy manner of propagation, but the plants so produced are inferior to those raised by the last two methods, and it is, therefore, now seldom practised.

ROOTS.—This is a very slow method, and seldom reduced to practice. It may, however, be employed in the case of new or rare sorts, or where it is difficult to obtain them by other means, as, for instance, in seasons like the present (1838), when most fig trees are killed down to the ground, and when, of course, cuttings cannot be obtained.

SEEDS.—This mode is very rarely practised, nor is it attended with any one advantage unless the object be the chance of obtaining a new or improved variety; and this cannot be reasonably expected from seeds indiscriminately saved, and the process of crossing is attended with such difficulties, on account of the peculiar organization of the flowers, that little dependence can be placed on our attempts to effect it artificially.

"Possibly," a late writer observes, "some curious horticulturist may find a mode of impregnating the female figs by hand, instead of the caprifying insect, which is not a native of this country." Seedling fig trees produce fruit in general in the sixth or seventh year in the native country.

Soil.—Figs are not at all choice in regard to soil, providing it be not too wet: in strong, loamy soils upon a dry bottom of rock, gravel, or chalk, they produce abundant crops, and are long-lived; in poor, light, sandy soils they are apt to shed their fruit before it has attained one-third of its natural size, and the trees in such soils often become debilitated and short-lived. Chalky or calcareous soils appear the most suitable for them: but wherever they are planted, provision ought to be made to prevent the roots penetrating too deep, which has the effect of producing gross and luxuriant shoots, which seldom bear fruit; whereas, when the roots are compelled to take a horizontal direction near the surface, this luxuriance is checked. Short, well-matured wood is annually formed, and these not only bring a greater number of figs, but the fruit is much earlier ripened.

Planting.—The month of March is the best time to plant figs, and in the warmer and southern parts of England they may be planted as dwarfs or open standards, or even as espaliers; but in colder and more northern situations, the best south or even hot walls are required for them.

Training and Pruning Standards.—The fig district of England is confined to the southern coast of Sussex and Hampshire, and the adjacent Isle of Wight, and there they are for the most part grown as dwarf standards, and produce abundant crops, without much pruning, which has been so long known as to have established the saying, "that a pruned fig-tree produces no fruit." So far this is strictly true, for the more a fig-tree is cut and pruned the more luxuriant it grows: the distribution and control of the sap, therefore, must be effected by training, and those species which nearest approach the horizontal are the best, and assimilate most to the natural growth of the tree.

Standard figs, therefore, require pruning only to the extent of removing all dead or decaying branches, thinning out those to a moderate extent where they grow too crowded, and occasionally shortening such as extend to too great a distance without sending out lateral shoots or spurs on which the fruit is to be produced.

The training of standards consists in forming the tree from a single stem, and encouraging the regular formation and extension of branches on all sides, and in inducing either a horizontal or pendulous habit in them. These objects being effected, little else excepting protection during very severe frost, is required. Bosc, a French writer on this subject, says, "The chief part of their culture consists in keeping their branches short, low, and spreading, to enjoy both the heat of the sun, and reflection from the earth. The ground," he observes, "is manured occasionally, and stirred once a year: and for protection from the frost during winter, the circumferential low branches are buried six inches in the soil, and the central ones enveloped in litter." This is the practice at Argenteuil, and other parts in the north of France, where immense quantities are grown, and where, particularly towards Lille and the Belgian frontier the cold is even more intense during winter than with us.

PRUNING AND TRAINING AGAINST WALLS.—Of all our fruit-bearing trees, the Fig is confessedly the least understood, and its management, therefore, is either totally neglected, or if attempted, carried on upon the most erroneous principles in many gardens. A knowledge of the habits of a plant must, to a certain extent, be understood before any certain mode of improvement can possibly take place in its culture. The following very sensible and judicious remarks upon the habits of our present subject, by the Hon. W. Wickham, will, we hope, be found useful:—"The fig-tree is distinguished from most, if not all, other trees by this extraordinary property, that it bears, and, in warmer climates, brings to maturity, in every year, two distinct and successive crops of fruit, each crop being produced on a distinct set of shoots. The shoots formed by the first or spring sap put forth figs at every eye, as soon as the sap begins to flow again in July and August. These figs (which form the *second crop* of the year), ripen, in their native climate, during the course of the autumn; but rarely, if ever, come to perfection in England, where, though they cover the branches in great abundance, at the end of that season, they perish and fall off with the first severe frosts of winter. The shoots, formed by the second flow of sap, commonly called midsummer shoots, put forth figs in like manner at every eye, but not until the first flow of sap in the following spring. These last-mentioned figs, which form the first crop of each year, ripen, in warmer climates, during the months of June and July, but not in this country before September or October. In warmer climates, indeed, very little attention is given to this first crop, because the midsummer shoots, on which it is borne, are commonly in the proportion only of one to six or eight in length, when compared with the shoots of the spring, which produce the second crop; and the crop itself is always small in the same proportion: but in England, it is the reverse, as no care or skill of the gardener can ever insure a second crop of ripe figs in the open air."

He therefore recommends a system of pruning, which may increase the proportion of the midsummer shoots, when compared with the spring shoots, both in number and length. " For this purpose he breaks off the spring shoots as they nearly attain their full growth, and just as the spring sap in each begins to abate something of its full vigour. He breaks them at moderate distances (six or fifteen inches, according to the strength of each shoot) from the place whence they severally spring, taking care that enough of the shoot be left to admit of its being bent back, and nailed close to the wall at the ensuing winter pruning, and that one eye at least be left uninjured by the practice; and always preserving a quantity unbroken, enough to keep up a sufficient supply of branches and wood. The shoot may be either broken short off, or left suspended by a few ragged filaments, which may afterwards be separated with a knife, when the spring sap has ceased to flow. The former mode is less unsightly, and will therefore be generally preferred by the gardener; but the latter has been found more successful in practice. It is of consequence, however, to the full success of this system, that the shoots should be broken, and not cut. If left to their natural growth, or shortened by a sharp, smooth cut with a knife (instead of a fracture), they would produce at their extremities only one single midsummer shoot, being a simple prolongation of the wood formed in the spring; but, when the shoot is broken at the time and in the manner above described, it generally happens that on the second flow of sap in July, two or three more shoots, forming a kind of stag's horn, are pushed from the fractured part, instead of one; and it is hardly necessary to add, that each of these, according to its length, will produce several figs in the ensuing spring, making the first crop of that fruit, all of which are capable of being ripened by our ordinary summer and autumn heats. A sufficient supply of midsummer shoots being thus procured during the summer, room must be made for them at the succeeding winter pruning, by cutting away so much of the old wood as will admit their being all trained in at full length, and nailed close to the wall, which should always be done before the severe frosts. Keeping this object in view, the knife cannot well be used too freely in cutting away the old wood; nor is there any reason to fear that its free use will either injure the future crops, or deprive the tree of its regular supply of branches. The midsummer shoots being trained in, each of them will produce, in the following year, one spring shoot at least at its extremity, while another will rise from each eye of the remnants of the old spring shoots that had been preserved in the manner above described, when these shoots were broken, in the preceding month of June. From this fresh supply, by preserving the system here explained, either wood or fruit, or both, may be obtained for the succeeding year, at the discretion of the gardener. Where wood is desired, he must break them in the month of June, in the manner and with the precaution that have been minutely explained."—*Hort. Trans.*

The horizontal and pendent mode of training have been recommended by Knight and others, with a view to check the too rapid ascent of the sap; and, indeed, that intelligent horticulturist has proposed the training of the fig to one stem only, from the top of which, and near it, let the branches be trained horizontally or pendently. "Under such treatment all troublesome luxuriance of growth will soon disappear: the pendent shoots will not annually extend more than a few inches, and few or no more leaves will be produced than those which the buds contain before they unfold. The young wood consequently ceases to elongate very early in the season, and hence acquires perfect maturity; while, by being trained close to the wall, it is secure, or nearly so, from injury by the severest frost. The quantity of mature and productive young wood thus necessarily becomes very great, relatively to the size of the tree; and the fruit, being in contact with the wall, and not shaded by excess of foliage, acquires an early and perfect maturity."—*Hort. Trans.*

Horizontal training, Lindley observes, is the most eligible for the Fig, as it checks its luxuriance, and by this means adds materially to the ripening of its wood; for, unless this be accomplished, it will be in vain to look for fruit.

On walls of sufficient extent, perhaps, the most satisfactory mode of training will be found to be the common fan form, allowing the branches to spread to a very great extent, and kept moderately thin, so as to leave space for training in young shoots at every part of the tree, taking care to keep up a complete supply of young wood towards the centre and bottom of the tree. This can always be accomplished by shortening any of the leaders, and by a judicious selection of such young shoots as naturally arise in proper places. The chief pruning should be performed in summer, by pinching off all unnecessary shoots, and using the knife as seldom as possible, unless it be in removing naked branches, or in cutting back to procure a supply of young wood.

PROTECTING THE FIG DURING WINTER.—The Fig is not only often very much injured by the frosts of winter, but is occasionally killed down to the ground, as has been the case this last winter, when few fig-trees in Britain have escaped. Our winters of late years have been in general so mild, that this precaution has been very much disregarded. The effect, however, of last winter's cold will, we think, induce most gardeners to adopt some sort of covering or other. It being admitted that covering is necessary, we will state a few of the materials used, and leave the application to the care and skill of the gardener, who will be guided by circumstances, such as the temperature of the winter, and the means he may have of procuring them.

The branches, whether of standard or wall-trained trees, may be tied together in bundles, and enveloped in mats, hay-bands, fern, straw, or other similar material, or they may be covered with paper, such as old newspapers, which, from the quantity of oil communicated to it in the ink, renders it less liable to imbibe moisture. Trees trained against walls may be protected by hanging reed or common mats in front of them, canvass, branches of spruce fir, laurels or similar evergreens, and young and flexible plants may be bent down and covered under-ground to the depth of four or six inches. It is necessary, in all cases of covering, to expose them sufficiently early in spring to retard the bursting of the buds, which, if too long protected, would be apt to spring too soon, and be cut off by late spring frosts. A moveable awning, therefore, of canvass mounted on rollers, and fixed to the top of the wall, so as to be let down and taken up, according to circumstances, would undoubtedly be the best.

Insects and Diseases.—The Fig tree may be said to be exempt from diseases, unless such as may be brought on by injudicious pruning, &c.; and in regard to insects, it is also almost free from them, at least when grown in the open air. The red spider and thrips often attack them in forcing houses; but both are brought on by over-heat and a deficiency of watering, and therefore can be got easily rid of by a free application of the syringe, or by sprinkling a thin solution of sulphur over the flues, when they are at their greatest heat. The green fly (*Aphis*) sometimes, but rarely, attacks them: fumigation with tobacco, or damping the leaves, and dusting them over with Scotch snuff or tobacco-powder, is completely efficacious.

Thinning the Fruit.—The fruit of the Fig seldom requires thinning; but no doubt, where many abound, a moderate attention to this would be beneficial to the trees, and also to those fruit which are left. On the open wall and on standards, it is judicious to remove all those young figs which make their appearance after midsummer, as they would not ripen without artificial heat.

Forcing.—The Fig is usually planted in large pots when it is intended to be brought to early maturity by artificial means, and is also often planted against trellises on the back walls of peach houses and vineries; and in some extensive establishments houses are dedicated to the purpose, as in the Royal Gardens at Kew, Hampton Court, &c. In regard to structure, any well-arranged peach house or vinery will be a good model for a Figery, in which they may be either planted out and trained as standards, or to trellises, or grown in pots or large boxes.

The above observations are applicable to plants of this kind grown in houses: such as are kept in pots seldom require any pruning, unless it be the removal of an ill-placed shoot, or to thin them a little, should they become crowded in their branches. The limited extent to which their roots extend, when in pots, completely checks that luxuriance of growth so common in the Fig, and at the season when the foliage and fruit require the most nourishment, it can always be supplied in the shape of liquid manure. When figs are planted out permanently in hot-houses, it will be well to limit the extension of their roots, by intersecting the border with brick walls, and laying the bottom perfectly dry, and impervious to the roots.

The season for beginning to force the Fig must always depend on the period when the fruit is wanted to be ripe; but the Fig, of all other trees, bears forcing the best, and will vegetate with much less chance of failure at an early period of the winter than the peach or the vine. December, January, or February, are the times for commencement in general: those begun to force in January will be ripe in June, and so of the rest.

The general temperature of the Fig house may be fixed at three or four degrees above that recommended for the cherry or peach house, increasing the heat, however, when the season of ripening begins, a few degrees more. The Fig, however, will succeed in the ordinary temperature of a pine stove; and upon the curbs and over the flues of such structures the Fig is very often brought to great perfection.

Figs grown in pots, particularly in a high temperature, require a liberal supply of water until the ripening of the fruit takes place, when it must be greatly reduced in quantity, both at the roots, and also over the foliage.

The late Thomas Andrew Knight, Esq., successfully forced the White Marseilles Fig, by removing them from the stove in the end of May or beginning of June (at which period the crop was gathered), and placing them under a north wall till September; he then transferred them to the stove, by which they ripened their fruit in January or February, and continued to produce till May or the beginning of June, when they were again removed from the stove, as above.

THE FILBERT.

THIS is the *Corylus avellana* of Linnæus, and belonging to his twenty-first class, *Monœcia*, containing all plants having male and female flowers separate on the same root. In the natural system, the tree belongs to *Amentaceæ*, which includes all plants which have their male flowers arranged in *aments*, or what are commonly called catkins, very conspicuous on this tree during winter. The female flowers are bright purple, small, and proceed from the largest buds.

Like the cherry, the Filbert is a native of Pontus; from whence it was carried, first, into Natolia and Greece, and from thence, by the Romans, into Italy. At what period they were brought into Britain is now very uncertain; that is to say, the large or cultivated filberts; for the wild, or hazel-nut, the original parent of the Filbert, is a native of most parts of this country, but almost as different from it as the wild apple is from the cultivated one. That the Filbert did not originate here naturally, but was an imported plant, is evident from the name, which was originally called full beards, or nuts with full beards, to distinguish them from the com-

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mon native sorts, and hence became corrupted to filbeard and filberd, and finally into filbert.

It is not improbable but that it was first introduced into the county of Kent, where it is more extensively cultivated than in any other part of Britain. It is said that there is more of this fruit grown within a few miles round Maidstone than in all England besides, several hundred acres being occupied with them alone. The principal supply of the London market is from the Kentish filbert orchards, and that of the large cob, or Barcelona nut, from Spain, where, as Swinburn, in his Travels, informs us, they abound in such quantities, that a single wood, near Recus, has produced sixty thousand bushels in one year alone; and the produce of one acre in this country has been estimated in some years as being worth fifty pounds sterling.

Filberts are supposed to be less difficult of digestion than the common nuts of our woods, but should only be eaten in moderation. In ancient times they were eaten after fish, instead of cheese, to prevent the engendering of phlegm, and hence the saying—

> " Post pisces nuces, post carnes caseus adsit."

Burning nuts is a famous charm amongst the Scottish peasantry, which did not pass unnoticed by the Ayrshire bard, who says—

> " To burn their nits, an' pou their stocks,
> An' haud their Halloween."

The Roman bridegrooms, on the night of their marriage, scattered nuts among the boys, intimating that they dropped boyish amusements, and thenceforth were to act the part of men.

SELECT LIST OF FILBERTS.

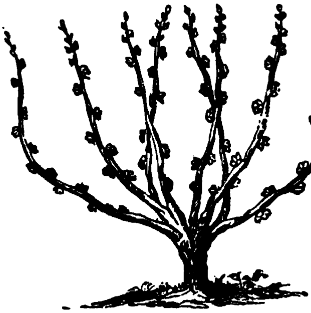
1. Red Filbert.—This variety is very distinct from all others, the pellicle of the kernel being of a crimson red colour. It is superior in flavour to the white variety, but is less prolific. It requires a light, hazelly, loamy soil, but not enriched by manure.
2. White Filbert.—A more abundant and more generally cultivated sort than the last. This is the sort so extensively cultivated in Kent. Both have a long tubular husk, which is so much contracted towards the apex of the fruit as to prevent its falling out, which renders them the best for keeping long in the husks.
3. Cosford Nut.—An improved variety of the hazel, brought into notice by Mr. Kirk, of Brompton, and conjectured to have been originated from seed by a Miss Young, of Cosford, in Suffolk. The sketch at the end of this article is an excellent representation of this variety, and will give a better idea of its merits than a page of letterpress description.

4. **Large Cob, or Barcelona Nut.—Trees of this sort were first introduced by John Ray, about 1665; but the nuts had been long known before that period, and annually imported from Barcelona. Not a prolific bearer in this country, probably owing, as Rogers supposes, from their being planted in too rich a soil.**
5. **The Frizzled Filbert.—This is comparatively a modern variety, said to have originated at Hoveton, near Norwich. It is easily distinguished from all other nuts by the frizzled appearance of the husk, which renders it rather ornamental, and fit for cultivation in the back parts of shrubberies.**

PROPAGATION.—The Filbert may be propagated by all the usual modes practised on ligneous plants; but the most certain is by laying the young wood in spring, or by grafting them upon stocks of their own kind, originated by seeds. If by the latter mode, the operation must be performed in February or March, as the sap rises early in this tribe. The Maidstone cultivators, however, increase them from suckers.

PRUNING AND TRAINING.—"It may be matter of wonder," says Rogers, "but so it happens, that the generality of gardeners know little or nothing about pruning filbert trees. The art has never been studied, either by masters or men; and it is remarkable that this branch of the pruner's art should have been brought to perfection by the untaught, unlettered Kentish peasant—without books, without master, save experience, without mistress, save Nature herself. It is curious, too, that this art has been engrossed by the labourers in the central parts of the country without its being followed in other parts of the kingdom." No author we have consulted has laid down any definite or even rational rules for pruning this tree, until the appearance of a communication in the *Lond. Hort. Soc. Trans.*, vol. iv., by Mr. Williamson, in which is detailed the rationale of the Maidstone practice, and which is to the following effect:—"The trees are trained with short stems, like gooseberry bushes, but with the heads in the shape of a punch bowl, and exceedingly thin of wood; and to prune them with an exact attention to the mode of bearing," our authority advises to plant the trees where they are to remain, to suffer them to grow without restraint for three or four years, and then to cut them down to within a few inches of the ground. They will push five or six strong shoots, which, the second year after cutting down, are to be shortened one-third. Then place a small hoop within the branches, and fasten the shoots to it at equal distances. In the third year a shoot will spring from each bud: these must be suffered to grow till the following autumn, or spring of the fourth year, when they are to be cut off nearly close to the original stem, and the leading shoots of the last year shortened two-thirds. In the fifth year, several small shoots will arise from the bases of the side branches which were cut off the preceding year: from these the fruit is to be expected, and the future object of the pruner must be directed to produce an annual supply of these by cutting out all that have borne fruit. The leading shoot is every year to be shortened two-thirds or more, and the whole height of the branches must not be suffered to exceed six feet. Every shoot that is left to produce fruit should also be topped, which prevents the tree from being exhausted in making wood at the end of the branch. Observe, in pruning early in spring, to have a due supply of male blossoms, and to eradicate all suckers."

The following excellent practical observations are given by Rogers on the same subject:—"The principle of the Maidstone pruners appears to be this,—to check and control the natural growth, and thereby bring forth the fruit-bearing principle in greater force and energy. After training the tree to a dwarf habit, they allow it to expend its strength in no other way than the production of flowers and fruit. The Filbert is naturally only a shrub, or small tree, and the cultivator makes it still less for his convenience. The young plants chosen are such as have been raised from layers, and which have been lined or bedded out in the nursery for two or three years. Each plant should have one strong upright shoot, of not less than three feet in height, this being necessary in order to the future form of the head; and this, early in the spring, is cut down to about eighteen inches from the ground. This height will admit of a clear stem of twelve inches below, and which part must be at first and ever afterwards kept free from shoots, as well as suckers from the root. If eight strong



Trained Filbert Tree.

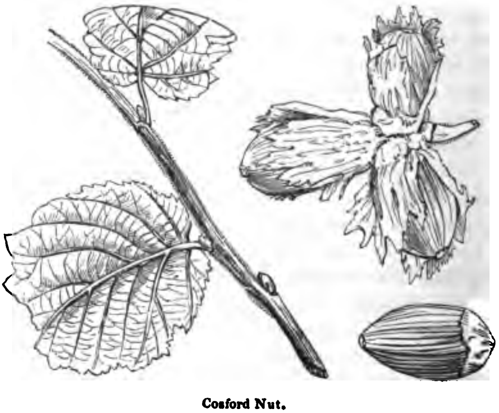
shoots be produced in the first summer, they must be carefully preserved, as that number is required to form the head; but if less than this number comes forth, than two or three of the strongest (or the whole if necessary) must be shortened back to half their length at the next pruning, in order to obtain the requisite number.

These being obtained, are to be carefully preserved and trained, at first nearly horizontally, and afterwards curving upwards, which will give them that open, cup-like form desired; and this may be facilitated by introducing a hoop into the centre of the bush, to which the shoots are to be fastened. This habit may also be assisted by observing always to cut at an outside bud. The centre to be from this time forthwith kept open and free of branches, and when these have attained the height of six feet, the tree, so far as training is concerned, is completed.

"The subsequent management of the tree," Rogers continues, "both while gaining the desired form, and afterwards, consists in preserving all the short spurs which will be produced on the branches, and cutting away or shortening the laterals which every year rise from the same. The management of these laterals is of great consequence. If they exceed the length of six inches, they may be cut back to a few buds; but if less, they should be preserved, as their points are generally fruitful. The grand object with the pruner is to have the branches thickly beset with fruitful spurs; and these are only reduced in length, when, after a few years' growth, they become too distant from the branch, when they are cut back to a healthy spur behind. If any part of the branch becomes accidentally naked, a strong shoot from the bottom may be led up, and managed so as to fill up the vacancy."

Gathering and Preserving the Fruit.—The maturity of nuts of all sorts is known by the cup turning brown, and by their readily quitting the husk. Those intended for long-keeping should be well ripened on the tree, and when gathered laid on a dry floor for a few days to dry, and afterwards packed in boxes or jars in dry sand. The late Mr. Bradwick kept nuts two years by closing them up air-tight in emptied butter firkins, and placing them in a cool cellar.

Insects and Diseases.—From diseases the Filbert may be said to be almost exempt, but not so from the attacks of insects; the most destructive of which, however, is the nut weevil (*Balaninus nucum*), the grub or larva of which is often very disagreeably found feeding on the kernel upon cracking the nut. The best description we have met with of this insect is in Salisbury's Hints to the Proprietors of Orchards, p. 95, who says the females lay their eggs in August, where the future young larvæ may find sufficient nourishment, and this place is always a young, green, and soft nut, in which the kernel is still very small; this the chafer (that is, the female insect) bores through with her rostrum, and knows by this not only whether the nut is good and sound, but also whether another chafer has not put an egg in it already, and hence we seldom or never find more than one larva in a nut. If it finds the nut in the required state, it proceeds to lay its egg in the kernel in such a manner that it remains sticking to it, and after a fortnight, or sometimes later, the larva comes out, and acquires its full size in September or October, at which time we find very often the nut filled with a larva, and its excrements instead of the kernel." The larva continues within the shell, either till it has eaten up the kernel and perished from want of food, which is the case when the kernel has not attained its full size before the larva is hatched, or until it has attained its full perfection, which is the case when the kernel is fully grown, and thus affording sufficient nourishment to enable the larva to eat its way through the shell, when it escapes, and buries itself under ground till the returning summer. Such being the economy of this insect, it appears, therefore, that the only period when its destruction can take place is in August, when it has attained its perfect state, and may be detected upon the trees.



Cosford Nut.

Gooseberry.

THE GOOSEBERRY.

The Gooseberry, in its wild or uncultivated state, is a native of various parts of Britian, as well as of most countries of Europe. That it was unknown to the ancients is highly probable, as no author notices it before the time of Gerard, Culpepper, and Tusser; the latter, in his *Five hundred Points*, &c., says —

> " The barbery, respis and goosebery to,
> Looke now to be planted as other things do;
> The goosebery, respis, and roses al three,
> With strawberies under them, trimly agree."

A gooseberry of a pale colour was introduced here from Flanders, in the time of Henry VIII., and is the only instance within our knowledge of any variety of this fruit having been brought from a foreign country. It may justly be called a British fruit, as it is met with here in greater rofusion and in a much higher state of cultivation than in any other ntry in the world. It is but little esteemed on the continent, for of being better known, and foreigners seem more astonished at the our gooseberry than with that of any other fruit, if we except the ry and the pine.

gin of the name has been accounted for in various ways, and r of names by which it is known evidently prove how uni-

Of these modes, that by cuttings is the most usual and successful, although they are sometimes also originated from seeds, with a view to obtain new or improved varieties.

CUTTINGS.—Forsyth says the best time for planting cuttings is about Michaelmas, always cutting them from the strongest and cleanest shoots: the length of the cuttings should be from six to eight inches, planting them on an east or north border, at the distance of one foot from row to row, leaving them about three inches above ground. Water them frequently in dry weather during the spring. Lindley says, when strong cuttings cannot be obtained, shorter ones of six inches in length will be sufficient, planting them so that the two upper eyes only are above the surface of the bed: these will generally produce two shoots each, the strongest of which, at the end of the first year, may be selected to form the stem of the plant, and shortened to the desired height. If one or two small cuttings only can be obtained from a plant for propagation, short lengths of three inches each, including the extremity, may be planted with success under a hand-glass, leaving only one eye above the surface, or, which is better, level with the surface: the month of October, he says, is the best time for this purpose. Abercrombie prefers the autumn, at the fall of the leaf, but says that it may also be performed any time in winter, in mild weather, and early part of spring; he selects well-ripened wood of last summer's growth, cuts them off about ten, twelve, or eighteen inches in length, and plants them in a shady border, inserting them to nearly half their length. Miller likewise prefers autumnal planting, and also the moderately strong wood from the bearing shoots, to those *gourmands* which issue from the main stem. Cut them at such a length as the strength and ripeness of the wood will bear, and cut off all the buds, excepting three, or at most four, at top, the lower part forming a single stem of nine inches or a foot high, from the top of which the branches should radiate upwards, at an angle of forty degrees, or better if forty-five degrees. Haynes, a modern cultivator, has practised taking off cuttings in July, when the fruit is on the tree, with a view to make certain of the sorts; he plants, waters, and shades such cuttings, and produces as good plants as from wood that has been fully matured.

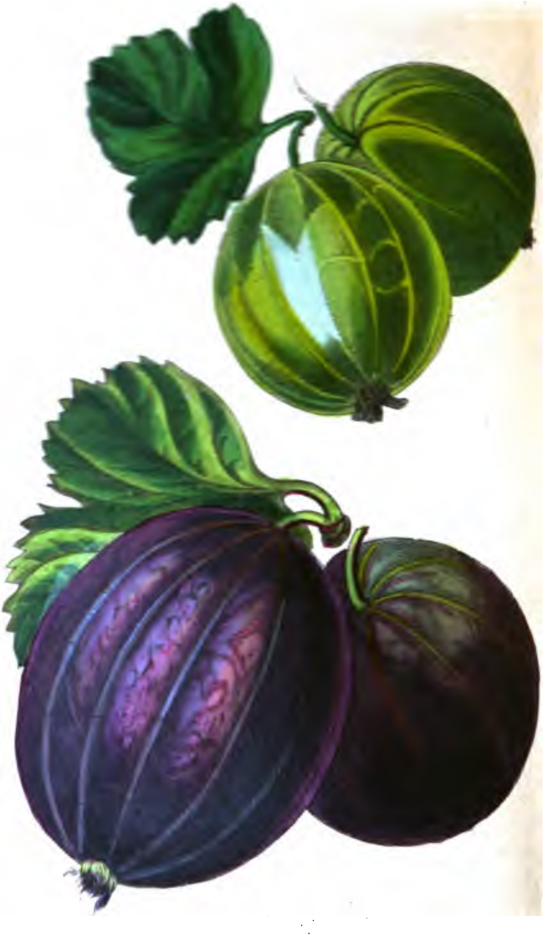
SUCKERS.—This mode is nearly abandoned by modern cultivators, because they are so readily propagated by cuttings, and not so much from an idea that plants originated by this means would have a natural tendency to throw up suckers to the extent so as to become injurious to the plant, or cumbersome to the ground. "There is, however," says Miller, "but little foundation for this, for it is peculiar to these shrubs to send up suckers, whether they be raised by seeds, cuttings, or by any other method: he therefore does not object to them, and observes that they will produce fruit the year following. The reason he gives for cutting off all the buds that are to be inserted under-ground, when the cutting is planted, is to prevent the production of suckers, or at least to lessen the tendency to their production.

Soil.—This plant appears to flourish in almost all soils, but of course in those that are rather humid and richly manured, the fruit will attain the largest size. The best soil, Rogers observes, is a fine fresh loam, neither too heavy nor too light, eighteen inches deep, and if resting on a subsoil of clay, so much the better.

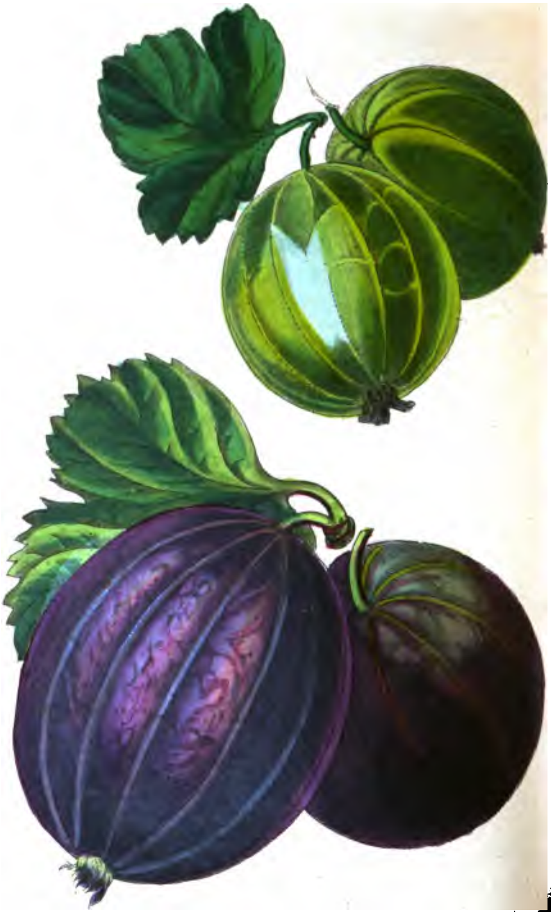
Planting.—Early autumnal planting is to be preferred in most soils; but any time during open weather, from October till the beginning of March, will do. The situation in which they should be placed is of much importance, and must be varied according to the object the cultivator has in view. If early fruit be desired, the earliest sorts should be selected, and planted against east or west walls, and indeed, in many cases, against south ones; that is to say, in those spaces where the permanent trees have not fully occupied them. Next to these situations, the warmest and most sheltered borders should be chosen. Where very late crops are desired, then the latest ripening and thick-skinned sorts should be preferred; the latter, because they hang long on the tree after they are ripe, without rotting or falling off. These being also planted against walls, are more readily protected from birds by netting, and also from frost, or excess of rain, by canvass or mats hung over them.

Where they are planted for general crops of fruit, and upon a large scale, then an open, exposed quarter of the garden should be selected, where they may be planted in parallel lines, about eight feet asunder, and six feet distant in the line. Some, however, prefer to plant them along the sides of the walks in the kitchen garden, at six or eight feet apart or more, according to taste. In whatever way they are arranged, they should never be set under the drip of trees; for, although we often see them so treated, we find at the same time that such bushes are more liable to be attacked by caterpillars than those that are more favourably placed, and also that their fruit is very inferior, and deficient in flavour.

In small gardens they may be with great propriety planted as espaliers by the sides of walks, and in this way they produce abundant crops, ripen early, and are improved in flavour, on account of the sun reaching them better than when grown in the standard fashion. In the gardens of Mr. Hope, in the Deepden, in Surrey, we have remarked them trained to

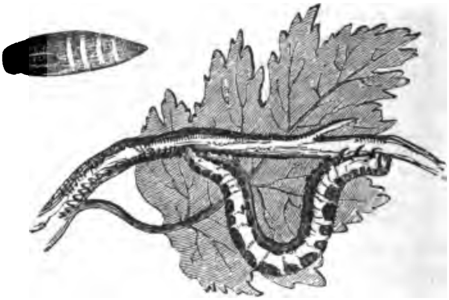


Gooseberry.



Gooseberry.

practised with good effect; and we find it also approved of by Mr. Thompson, who, in *Ency. of Gard.*, directs one end of a stick to be placed against the upper part of the stem of the bush, and the other struck with a mallet, by which the greater part of the caterpillars will be shaken to the ground. In order not to injure the bark, the end of the stick may be rather broad, and covered with leather; but not so much padded as to counteract the smartness of the stroke. The first and second strokes are the most effectual, because, after the alarm is given, the caterpillars exert themselves in securing their hold. When the caterpillars are on the ground, they may be easily destroyed by sprinkling them with lime-water, tobacco-water, or, according to some, with a decoction of walnut-tree leaves, potato haulm, or chamomile flowers."



Chrysalis and Caterpillar of the Gooseberry Moth.

THE MEDLAR.

The Medlar has long been cultivated in this country, but has always been considered as an inferior fruit; and, although esteemed by some, is perhaps the least in general estimation of any of our common fruits. It is a native of the south of Europe, but appears to be naturalized to some parts of England.

Varieties.—Miller appears to consider two sorts only, viz., the common or Nottingham, and the large Dutch Medlars, as worth cultivation as fruit-bearing trees. Forsyth also prefers the Great Medlar and the Dutch, but observes that there is a smaller sort, which is a variety of the German or Dutch sort, and the Oriental sort, mentioned by Miller as a native of Mount Ida, in Crete, as well as several species introduced from North America; but these are, he considers, more trees of ornament than for the value of their fruit. Rogers recommends only the Large Dutch and Nottingham Medlars, and Lindley joins him in this recommendation.

SELECT LIST OF MEDLARS.

1. Dutch Medlar. 2. Nottingham Medlar.

Propagation.—The Medlar may be propagated by all the modes usually employed in rearing fruit-trees, but grafting and budding are the most general in practice. The best stock for either purpose is the common pear stock, although the white thorn is also sometimes used; but trees wrought on the former of these are always the best.

Soil.—The Medlar is by no means very choice with respect to soil; one that is of a deep loamy and rather humid nature, provided it be not wet at bottom, is the best.

Pruning.—This tree produces its fruit on spurs, and requires but little pruning after the head is properly formed; to effect which a judicious shortening of the shoots for the first two or three years of its growth is required. It is usually treated as a standard tree, and one or two are considered sufficient for the consumption of a large family.

THE MELON.

Neither the native country of the Melon, nor the date of its introduction into this country, is at all known. It is supposed to be a native of Persia; at least it was from that country that it was introduced into Europe. It appears to have been cultivated in England prior to 1570; but that we still possess the individual variety then grown is, we think, highly improbable, on account of the great liability of this fruit to sport into varieties when grown in common.

It appears by some authorities that we received the Melon direct from Jamaica; but, as they have abounded in many parts of the south of Europe for ages, having been introduced to Italy from Armenia, may we not reasonably infer that they were brought hither from Italy or Spain? Of late years we have received many new and very excellent and distinct varieties of this fruit from Persia, where, if not indigenous, they must have been extensively cultivated for ages. The early introduced sorts from Jamaica were called Musk Melons, a name now nearly obsolete. The Cantaleups are known to have been brought from the neighbourhood of Rome, from a place of that name, where the Pope has a country seat, and to have been distinguished by their nearly globular form, rough, warty, or netted outer covering, and by both their fruit and leaves being of moderate size. The Romanas also are of Italian origin, and were once held in great esteem: they differ from the Cantaleups in being larger, oval-shaped, netted, and having their fruit and leaves also rather larger, as well as in being more abundant bearers. The varieties originated from the Cantaleups and Romanas were long held in esteem, and, although many of them are now lost, many others have arisen of greater or of equal merit. The Persian sorts also form quite a section by themselves. "They are altogether destitute of the thick, hard rind which characterizes" the European sorts, "and which renders the one-half of every fruit useless; on the contrary, they are protected by a skin so thin and delicate, that they are subject to injury from causes which would produce no perceptible effect upon the Melons of Europe. Their flesh is extremely tender, rich, and sweet, flowing copiously, with a cool juice, which renders them still more grateful. To these important qualities they in many cases add the merit of bearing abundant crops of fruit, the appearance of which is always extremely beautiful.

"But, on the other hand, their cultivation is attended with peculiar difficulties: they are found to require a very high temperature, a dry atmosphere, and an extremely humid soil; while they are, at the same time, impatient of an undue supply of moisture, which causes spotting and decay long before the fruit is matured. It is not, therefore, easy to maintain that necessary balance of heat and moisture, which in Persia arises out of the very nature of the climate and mode of cultivation. In that country, we are told, the Melon is grown in open fields, intersected in every direction with small streams, between which lie elevated beds richly manured with pigeon's dung. Upon these beds the Melons are planted. The Persian gardener has, therefore, to guard against nothing but a scarcity of water; every other requisite is provided by his own favourable climate. With us, the atmosphere, the ventilation, the water, and the heat, are all artificial agents, operating in opposition to each other. The most successful method of cultivation which has yet been practised seems to be, to supply the plants abundantly with water at the roots, but to give them as little as possible over-head; to combine copious ventilation and high temperature, by means of frequently renewing the linings with hot dung, and to elevate each fruit a few inches above the soil, by means of a slate laid upon two bricks placed side by side."—*Lindley's Guide, &c.*

SELECT LIST OF MELONS.

1. Black Rock.—Fruit, large; form, somewhat oval, but flattened at the ends; colour, deep green, turning yellow when full ripe, and covered with large darkish carbuncles; flesh, thick, very firm, deep orange when ripe; weight, from eight to fourteen pounds.
2. Early Cantaleup.—Fruit, small; form, nearly globular; colour, whitish green, with dark blotches; flesh, deep orange, and firm; weight, from two to four pounds. A very prolific bearer, setting its fruit well. Introduced from Portugal about 150 years ago by the Hon. Dormer Stanhope.
3. Early Polignac.—Fruit, medium size; form, nearly globular; colour, pale yellow, very slightly warted; flesh, thick, yellowish red.
4. Hardy Ridge.—Fruit, small; form, roundish, somewhat flattened; colour, dull yellow, mottled with green; flesh, orange red, not very thick. An excellent, hardy sort.
5. Montague Cantaleup. — Originated at Ditton Park, near Windsor, a seat of Lord Montague, about twenty years ago. Fruit, middle size; form, varying

from round to oval; colour, greenish white, slightly netted; flesh, red, thick, soft, and delicate. One of our best sorts.

6. Orange Cantaleup, or Golden Cantaleup.—Introduced from the south of France to Sir Philip Stephens. Fruit, medium size, or rather below it; form, globular; colour, yellow, slightly netted on the surface; flesh, deep orange red. "If cut," says Rogers, "before it be fully ripe, it may be kept for a considerable time, first in a cool, and afterwards in a warm place, to prepare it for the table. By such means it may be kept good till the end of October."
7. Netted Succada, or Coral Succada.—Introduced by the same gentleman, and at the same time with the last. Fruit, under the middle size; form, round; colour, dull pale green, closely netted; flesh, deep orange, approaching light scarlet. An excellent bearer, setting its fruit freely.
8. Romana.—One of our oldest varieties, so called from that part of Italy, where it is much grown. Of this sort there are three varieties; the oval, the round, and the netted. Rogers informs us, that he has cultivated this sort for sixty years without observing the least change of character in it; and states the fact to show the possibility of cultivating the Melon, without allowing it to become mixed with other sorts, a circumstance we have great doubts in believing. Fruit, middle-sized; form, oval; colour, pale yellow, and netted; flesh, deep yellow; varying in weight from one to four pounds.
9. Silver Rock.—So called to distinguish it from the Black, Golden, and other Rock Melons. Fruit, about middle size; form, nearly round; colour, greenish yellow, with many small warts and orange-coloured blotches; flesh, salmon-coloured; weight, from three to five pounds.
10. Scarlet-fleshed Rock Cantaleup.—Of this kind there appears to be many varieties, chiefly differing in size; they are mostly all thick-skinned, but exceedingly high-flavoured; they are much grown about Winchester and Southampton for prize competition. Fruit, nearly round, and oftentimes ovalish; colour, dark green, when in perfection, turning yellowish when over-ripe, much carbuncled on the surface; flesh, bright scarlet; weight, from two to three pounds.
11. Green-fleshed.—Of green-fleshed Melons there are several varieties of great merit, but they resemble each other in so many particulars, that it would be next to impossible to describe them separately, so as to be of much utility to the inquiring reader. Green-fleshed Melons are by no means new to our gardens; they were known in the time of Miller, but fell into disrepute on account of an idea that the softness of their pulp caused flatulency. Than this nothing can be more erroneous; and, so far as flavour is concerned, we think them the best of all sorts.

ESTEEMED PERSIAN SORTS.

[*The descriptions of the following are taken from Lindley's Guide, from which excellent source we have drawn pretty liberally in the foregoing.*]

1. Daree Melon.—Fruit, oval, about nine inches long, and six inches in diameter; skin, closely mottled with dark sea-green upon a pale ground, rather widely netted, but is subject to become smooth; flesh, white, thick, crisp, and melting: when fully ripened, very sweet, but rather insipid if imperfectly matured; it is always, however, cool and pleasant.

2. Geree Melon, or Ostrich Egg.—A handsome green fruit. In shape it is oval or ovate, eight inches long, and four inches and a half in diameter; the skin is closely mottled with dark sea-green, upon a pale ground, and is either netted or not; in the former case the meshes are very close, by which character it may be readily known from the Daree. When well ripened, various numerous longitudinal fissures appear upon the rind, which has sometimes from nine to eleven short dark-green streaks radiating from the apex. Stalk, very short; flesh, one inch and a half to two inches thick, bright green, melting, very sweet, and high-flavoured. The Geree Melon is a good bearer, but tender.
3. Green Hoosainee.—Fruit, handsome, egg-shaped, five inches long, and four inches in diameter; skin, when unripe, of a very deep green, but, when matured, of a fine, even, light green, with a regularly netted surface, which, on the exposed side, becomes rather yellow; flesh, pale greenish white, tender and delicate, full of a highly perfumed, pleasant, sweet juice: the rind is very thin, the seeds unusually large. This is a variety of much excellence: it is a great bearer, and hardier than any of the Persian melons, except the Large Germek.
4. Large Germek.—A very handsome ribbed fruit, generally weighing five or six pounds, shaped like a depressed sphere, usually six inches deep, and from seven to nine inches in diameter. At the apex is situated a corona, or circular scar, varying from one to two inches in diameter; skin, sea-green, closely netted; flesh, one inch and three quarters or two inches thick, clear green, becoming paler towards the inside, firm, juicy, very rich, and highly flavoured. This is an excellent variety, ripening early, and speedily arriving at a bearing state: it is very prolific, and produces larger fruit than any of the Persian melons: it generally produces a second crop spontaneously.
5. Melon of Keising.—A beautiful egg-shaped fruit, eight inches long, five inches wide in the middle, and six inches wide at the base; skin of a pale lemon colour, minutely speckled with paler dots, regularly netted all over, with a few cracks lengthwise; flesh, from one inch and a half to two inches and a quarter thick, nearly white, flowing copiously with a cool juice, extremely delicate, sweet, and highly flavoured, similar in texture to a well-ripened Beurie pear.
6. Sweet Melon of Ispahan.—Fruit, oval, from eight to twelve inches long; skin, nearly quite smooth, of a deep sulphur colour; flesh, white, extending to about half way to its centre, crisp, sugary, and very rich; weight, five to six pounds.
7. Dampsha Melon.—First fruit in the season nearly cylindrical, bluntly rounded at both ends. The skin varies from pale yellowish green to intense dark olive, and the whole fruit is prominently netted; flesh, bright and deep green near the skin, pale towards the centre, quite melting, and of excellent flavour. The latter fruit becomes more pointed at the ends, and lose much of their reticulation on the surface, the dark green of the skin becoming darker.
8. Green Valencia, or Winter Melon.—Fruit, oval, with pointed extremities, very slightly ribbed; skin, dark green, dotted with very light green, sometimes a little netted; flesh, white, becoming pale straw colour as it ripens, firm, saccharine, and juicy, and although not rich, is pleasant.

The great merit of the last two sorts consists in their keeping till the winter months if suspended by the stalk or hung in a net in a dry room.

Nevertheless, we do not think that ever these, or indeed any of the Persian kinds, will supplant many of those that have been long cultivated in our gardens.

PROPAGATION OF THE MELON.

The Melon is propagated by seeds, although some cultivators increase it by cuttings also. It appears that Mr. Paxton is of this latter opinion, as he observes, in his review of Lindley's Guide, &c., that "cuttings are preferable under all circumstances, either for cucumbers or melons."—*Hort. Reg.*, vol. i. p. 164. This may be carrying the practice rather too far: we may here, however, observe, that plants originated by cuttings are as soon as they are rooted to be treated exactly as if they had been propagated from seeds.

Sowing Melon Seeds.—The season for having this fruit in the highest perfection in England is during the months of June, July, and August; nevertheless it may be produced much earlier, and continued much later by successional sowings. The average period that elapses between the time of sowing the seeds and the ripening of the fruit, is about fifteen or eighteen weeks, and the usual time of sowing for early and principal crops is from the middle of January to the middle of February. Little is gained by sowing sooner, for the short and dark days of winter are very unfavourable for young melon plants, besides the extra expense of dung or fuel and labour. Those who sow in the second week of January will in general have fruit as early as those who sowed in December, and with much greater certainty of success, and fewer chances of losing them altogether.

In regard to the choice of seed, which should be a consideration with every cultivator, care should be taken that it be obtained from specimens of superior quality: therefore, the seeds of the finest fruit should be carefully preserved, and as they are produced in sufficient abundance, and retain their vegetative properties for many years, few, we think, need be at a loss to possess themselves of this requisite. Miller and the older gardeners appear to have entertained strange notions in regard to this subject; that author recommends a change of seed annually, as if the cultivation of it for more than one season in the same garden would deteriorate its merits. He recommends seeds of three years old as the best, and objects to those that are older, as being too much exhausted to produce fruitful plants. This is, however, not the case, as seeds of ten, fifteen, and even twenty years old, and upwards, have vegetated and produced excellent crops of fruit. Seed under two or three years of age are apt to produce plants which run too much to vine, and produce too great a proportion of male blossoms. To correct this superabundant luxuriance in new seeds, Miller, Abercrombie, and most other gardeners since their time, recommend placing them in phials, or paper bags, and suspending them near the fire, or in the window of a dry room, and many carry them in their pockets for some weeks, or even months, before they sow them.

Melon seeds are usually sown in cucumber beds that may be already at work, as they are in general begun much earlier than the latter; when such is the case, the melon seeds should be sown in pans or pots, and plunged in the warm dung, where they will speedily vegetate. But some cultivators who have plenty of room prefer to put up a separate bed for the purpose, and one for a single-light-box will be quite sufficient to rear plants for the largest establishment. In either case the seeds must be guarded from the attacks of mice until they vegetate, and this can be easily effected by laying a piece of glass over the pot, or covering it with a bell-glass. When the plants come up, and the leaves have attained the size of about half an inch in diameter, they should be transplanted into pots of four or five inches over, placing three in each pot, and watering them at the same time with water of the same temperature with that of the atmosphere of the bed. Air must be daily admitted by opening the light more or less according to the state of the weather, and temperature of the bed, for inattention to ventilation, or a misapplication of it, is the cause of more disasters in early forcing than any one thing besides.

In regard to ventilation, we have the following very excellent directions laid down by Abercrombie:—"Admit fresh air every day in moderate weather, at the upper end of the lights, raised an inch or two, according to the temperature of the external atmosphere, more freely when sunny than cloudy; shutting closer, or quite close, as the afternoon advances towards evening, or sooner, if the weather changes cuttingly cold." In strictly attending to ventilation, the Dutch gardeners excel us very much, and they find the benefit resulting from the practice in the increased vigour of their plants, from having a proper and pure air to live in, as well as in the economy of heat, in whatever way it may be applied. Nothing can be more injurious to young and tender plants than to be pent up for days together within the narrow limits of a hot-bed in a high temperature, and in a moist atmosphere approaching almost to the point of saturation. Such a situation is unnatural to most plants, and to the Melon in particular. All extremes should be avoided: a steady and permanent heat is required, varying only from sixty-five degrees as a minimum to seventy-five degrees as a maximum: a humid, but not saturated atmosphere should be maintained; and both these may be, by diligence on the part of the gardener, regulated, merely by a strict attention to ventilation. The young plants, as soon as potted, should be re-plunged again into the bed, but probably not quite up to the brim; this must always depend upon the temperature of the medium they are plunged into. The surface of the mould in the pots should be carefully stirred up every other day, if only to the depth of the eighth of an inch; and the whole surface of the bed should also be stirred up frequently to a much greater depth. This will prevent the accumulation of noxious matter on the surface, which, if not removed by stirring, would create a kind of malaria within the bed, and also tend to keep down the heat, which should be allowed to ascend freely to warm the atmosphere of the frame, so as to admit of a greater portion of fresh air being allowed to enter by means of ventilation. To prevent too great a rush of cold air entering at once into the frame, it will be well during winter, but in cold, windy, or frosty weather in particular, to hang a thin mat, or pieces of perforated canvass over the openings, by which the force of the current will be broken before it reaches the plants; and this precaution should always be taken when the steam within is so powerful as to render it necessary to leave a portion of the sashes open during the night for its escape.

The young plants, having attained their first rough leaves, should then be stopped, which is done by pinching or cutting out the first embryo of the shoot which will appear in the centre between the leaves. This operation is necessary to strengthen and promote the lateral issue of future runners or young branches.

While the young plants are gaining strength in the seed bed, preparations should be made for providing a fruiting bed for them, which should be formed of well-fermented dung and leaves of trees: its length may be for one or more three-light frames, according to the quantity intended to be grown. Such beds should not be less than four feet and a half in height, observing to make them of the same height both at the back and front; and, to give the required angle of elevation, the ground the beds are built upon should be formed on an inclined plane of the angle required. This plan was adopted by the late President Knight, upon the correct principle that both the back and front of beds so constructed would be of equal temperature, whereas those built upon the old system never could be so.

When the plants are fit for removal, and the fruiting bed sufficiently heated for their reception, they should be removed to it, choosing the middle of a fine day for the purpose, as they are very liable to sustain injury if exposed for the shortest period to the cold. It is not a bad plan to cover the plants with a bell-glass when they are removed; but, if the distance be considerable, then it will be necessary to place them in a small box, with a lid to it, or within a large flower-pot, with a cloth tied over its mouth.

The fruiting bed should not be of less depth, if put up about the 1st of February, than four feet and a half, and a foot wider than the frame all round. After it has stood six or eight days, it will be fit to receive the plants, which are to be set on what are called hills, that is, small mounds of earth placed under the centre of each light, and within nine inches of the glass. It is not necessary to cover the whole surface of the bed with mould at this time, for it has been found much better to do so progressively, by enlarging the mounds as the roots extend towards their outer sides. This practice has two very important advantages, viz., by increasing the hills as the roots extend, and no faster, it operates as a kind of pruning, by causing them to send out numerous fibres from their main roots; and hence, by increasing the number of spongioles, enable them to imbibe a much greater portion of nutriment: besides, it admits of the heat of the bed ascending into the frame, accompanied with a fine genial steam, which, if the materials have been properly prepared, will be beneficial to the plants rather than otherwise, and, being charged with ammoniacal gas, is destructive to insects, while it promotes vegetable growth. Some cultivators cover the whole surface of their beds with an inch or two of mould before the plants are set into them, and others lay turf, with the grassy side undermost; both of which are done with the view of keeping down the steam. This we think an erroneous practice, and would rather advise stirring up the top of the dung-bed with a small hand-fork every other day or so, to encourage the ascent of a moderate share of steam, and also to prevent the growth of various species of fungi, which an impure or stagnated air would produce. It may, however, be advisable to place under each hill a round turf of three inches in thickness, and of a good rich loamy nature, which will prevent any violent heat ascending into the hill in the early stage of culture, and give strength to the plants afterwards, when their roots have penetrated into it.

When the plants are of a proper size, and the fruiting bed in condition, they should be planted into the hills. For this purpose, turn them carefully out of the pots, and set them in the centre of the hills, three plants in each, and give them a little water over their leaves, and also at their roots, but this water must be brought to nearly the same temperature as that of the atmosphere of the bed, by being placed in it over-night: indeed, it is well in early forcing to have in each frame a small flat watering-pot, kept full of water for this purpose. A steady and regular temperature must now be maintained, never below sixty-five degrees, nor need it exceed seventy-five degrees, unless by sun heat. When the heat of the bed declines, applications of hot dung must be made round it by linings; but it is seldom necessary that the whole bed be surrounded at once; it is, in general, better to do it at two or three different times. The bed, before the linings are applied, and they themselves afterwards, should be thatched with bean haulm or littery matter, to protect them from cold wind and rain; the former deranges the heat, by blowing it from one side of the bed to the other; and the latter not only chills it, but causes the linings rapidly to decay.

Air and water must be especially attended to throughout their whole growth, and the supply of both increased as the season and plants advance. Air must be given upon every favourable opportunity while the plants are in flower, to aid in setting them, but even this cannot be left, particularly early in the season, entirely to chance; at that period of their growth the supply of water must be lessened, as an excess of humidity would not only prevent the flowers from setting, but would also endanger the rotting of the fruit, even when it has attained the size of a walnut, or even larger. Water should be always applied in the morning till the middle of May: after that period the afternoon is the most proper time. The water should never be applied colder than the air of the bed until the end of June or beginning of July. Melons require much less water than cucumbers, and some excellent cultivators do not water them more than four or six times during their growth; but this depends greatly on the soil they are grown in. Light, open soils require the most water; but these are seldom used for this fruit, strong, holding loams, approaching to clays, being preferred. Water should seldom be given near to their stems, as it often causes them to canker and rot: besides, there are few roots there to derive benefit from it, these being generally round the edges of the frame; it therefore follows that the water should be given at some distance from the stems. As the fruit approaches its full size, decrease the quantity of water, giving just sufficient to keep the plants alive, that is to say, if regard be paid to the flavour of the fruit, otherwise water may be given to keep the vines in vigourous growth for the production of a second or even a third crop. These latter productions we seldom have found worth sacrificing the flavour of the first crop for, and have found it much more certain to have a supply of young plants in reserve, wherewith to replant the beds as soon as the first crop is ripened off.

As the roots extend towards the extremity of the hills add fresh mould to them, to the extent of three or four inches at a time, and continue this till the hills have, as it were, met, and formed a ridge the whole length of the bed. From this time add to the sides of the ridge, reserving as long as possible a space next to the frame unearthed, for the more ready entrance of the heat from the linings.

As the hills extend in surface, train the shoots in a regular manner over them, and when they have shot out to three or four joints, and do not show fruit, (that is, female blossom, which will always be readily distinguished from the male flowers, as the former has the embryo fruit at its base,) the shoots should be stopped there, by pinching the points out of them, in order to cause them to send out lateral or side branches, which will in general show fruit in abundance. Such shoots as at this time do not show fruit, if the vine be at all crowded, may be removed, to prevent confusion, as may also some of the weakest and strongest; for it is from the middle-sized shoots that the fruit is to be expected. A regulation of the shoots at this stage should not be neglected, for if the vines get once into a state of confusion, nothing but severe pruning can again bring them into order, and few plants suffer more from the use of the knife than the Melon. As the shoots to be retained extend, they should be neatly pegged to the ground, to keep them in their proper places.

Artificial fecundation is very necessary at an early period of the season, and perhaps it ought to be attended to more generally than it appears to be t all times. Nicol says he has proved experimentally that Melons not impregnated will not swell off so fair and handsome as those that are impregnated; our own observations exactly agree with this opinion.

As the fruit sets, lay each upon a piece of tile or slate to prevent its damping while young, and when ripening they will be improved if elevated upon an inverted flower-pot, so as to place them near the glass and from under the shade of the foliage; they will also become better flavoured on all sides than if left on the surface of the mould.

Different varieties require different periods to arrive at perfection: from the time fecundation takes place it is usually from a month to five weeks; but much depends on the health of the vines, for if they be stinted from mismanagement or from an over crop, the fruit will ripen prematurely, in less time than stated above, and before it has attained full size. The ripening may be known by the following criteria:—by emitting an agreeable and powerful perfume, by the base of the footstalk cracking away from the rind, and by the fruit turning of a yellowish colour. It is always best to cut the fruit before it is too fully ripened, particularly if it be intended to be sent to a distance.

Soil.—The continental gardeners differ widely from us in respect to soil for Melons. With us it can hardly be too strong and retentive, and with them it is light and porous in the extreme, chiefly composed of decayed dung and leaves, with a portion of sand intermixed with it, their object being chiefly to grow very large fruit, without great regard to flavour, while ours is to have moderately sized fruit and the highest flavour possible.

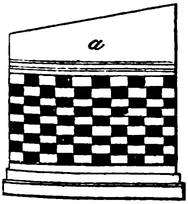
Abercrombie recommends "any unexhausted loam, rich in vegetable rudiments, with a mixture of sand, but not too light. The following," he says, "is a good compost: two-thirds of top-spit earth from a sheep common, adding sharp sand, if the earth contains little or none, till half is sand, one-sixth of vegetable, and one-sixth of well-consumed horse-dung. Or, if the earth be not obtained from a pasture, rotted sheep-dung may be substituted for the last. The ingredients should have been incorporated and pulverized by long previous exposure and turning over. The compost should be dried under shelter before it is used." M'Phail's choice of soil approaches nearer to our own; he says, "Melons will grow and produce fruit of a good flavour if they be planted in any kind of earth not of too light a texture, whether it be taken from a compartment of the kitchen garden or from a corn-field, mixed well with good rotten dung; but earth of a loamy nature is the best, because it retains moisture longer than light earth. Earth dug from the surface of a common, where sheep and cattle have long been pastured, is excellent for the Melon. It should be broken well, and lie a few months before it is used, and if it be exposed to a winter's frost, it will do it good. This sort of earth, if it be taken from the surface of a common, will require no manure the first year of using." He here also recommends, unless the earth which is used be very strong, the practice of treading it well when put into the beds, to cause it to retain its moisture longer than if it were left loose.

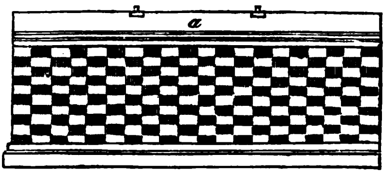
If strong, rich, loamy soil can be procured from a good sheep walk, it may be used at once, without either the addition of manure or exposure. Indeed we think it can hardly be too strong, nor do we hold with its being over-enriched by manure, as this would have a tendency to cause the plants to grow too luxuriantly to vine: in the latter case it will require but little water, and hence the flavour of the fruit will be enhanced.

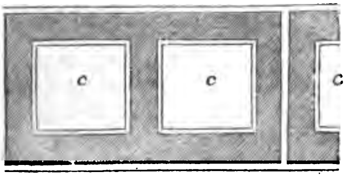
Structures for the Growth of Melons.—The most primitive and also the one in most general use is the common dung-bed and wooden frame, which are both so well known as to require no description here. Of other structures we may mention the fluid pit used by Nicol and others, and which in principle or dimensions differs but little from those in ordinary use for the growth of young pines, &c.,—M'Phail's pit, West's pit, the Alderston pit, Atkinson's pit, the common open pigeon hole pit, &c.

These are all, with the exception of the first, heated by vegetable matter kept in a constant state of fermentation, and regulated in temperature by the application of external linings. The first is now seldom used, the heat produced by smoke flues being found too uncertain, and unless great care be taken to keep the atmosphere to a proper degree of moisture by sprinkling water on the brick work, and indeed over the plants, the air becomes too dry for the prosperous growth of this plant. The heating such pits by hot water is a decided improvement, as by this means the temperature may be regulated to the greatest nicety, and a sufficient degree of humidity kept up, by having the top range of pipes cast of a square or flat form, with raised margins, so as to form a shallow canal along their top, to be kept supplied with water.

M'Phail's pit may be readily understood by a glance at the annexed cuts. *a*, is a frame of wood, differing not from those in ordinary use; *b*, is the

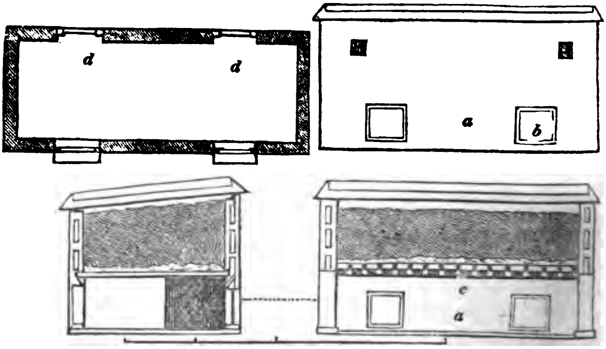






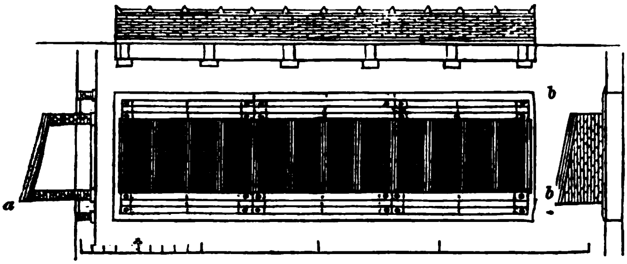
basement on which the frame is set, having the outer walls built open, and round these linings of hot dung and leaves are placed, which throw heat into the flues which surround the cavities *c c c*, in which the mould for the plants is placed. This is an expensive pit in the first instance, and requires a more than ordinary quantity of dung to work it. We ought here also to observe, that the linings are surrounded by a nine-inch brick wall, which improves the appearance and economizes the dung. The principal advantages of such a pit may be stated in a few words; the dung requires no preparation, or expenditure of its heat previous to using, and there is little to be apprehended from the plants sustaining injury, either by the admission of rank steam or from over-heats; and, therefore, it is a very proper pit for those who have plenty of dung, and little time to attend to its management.

West's pit is also built of brick, and differs from the above in several particulars, as will appear by the accompanying cut. *a* is a chamber to

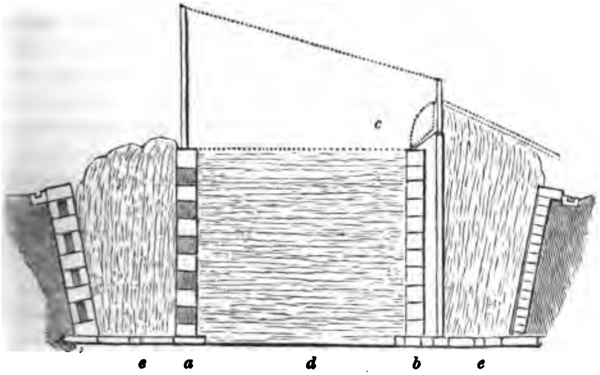


contain the dung, which, as in the last case, need not be previously fermented; *b*, a square opening in the back wall, by which the dung is introduced; *c*, rafters of wood or cast iron, supporting the soil in which the plants are to grow; *d*, *d*, openings to permit the ascent of steam.

The Alderston pit is described in the Memoirs of the Caledonian Horticultural Society, vol. ii. p. 217, and is much in use in Scotland. The front and back walls (*a a*), vide opposite cut, are of brick-work, supported on piers or stone pillars; the linings are applied in the spaces *b b*, which are surrounded by exterior walls, and covered over with boards, which gives the whole a very neat appearance. The body of the pit is filled with fermenting material, and as no intervening object separates the linings from the larger mass, no heat is therefore lost. This is one of the most complete of all pit structures.



The next pit of any pretension is that of Mr. Atkinson, and described and figured in the Transactions of the Horticultural Society, vol. vi. p. 373.



This pit, which is constructed of brick-work, may, like all those already noticed, be partially sunk under the ground level, which will give it a lighter appearance, but this can only be done in situations perfectly dry at the foundation. The back wall *a*, as well as the end ones, are four inches thick, (that is, brick laid in bed), but is built hollow, in the pigeon-hole fashion, to the height the linings are to be applied: above that the walls are solid. The front wall, *b*, is double; the interior portion is brick in bed, the exterior brick laid on edge, and supported with a pier under each rafter. The space between these two walls in the front communicates with the inside of the bed *c*. The linings are applied in the usual manner at *e e*, and communicate their heat to the bed *d*.

The common pigeon-hole pit requires no elucidation; it is formed of open pigeon hole, four-inch sides and ends, carried up to within one foot or fifteen inches of the top of the front wall, and to within about two feet of the top part of the back; but as such walls are liable to be pushed out of the perpendicular, either by treading within the bed or upon the linings without, it will be advisable to carry up the corners fourteen inches square, as well as piers, at reasonable distances, of the same dimensions, observing to divide the extra thickness of these piers equally between the inside and outside of the walls, and also to place them in the front and back walls, not *opposite*, but *alternate*.

All pits should have a gutter or shoot to carry off the water that collects on the glass, to prevent its falling on the front lining.

CULTURE OF THE MELON UNDER HAND-GLASSES, AND IN THE OPEN AIR.—The Melon is pretty successfully ripened on beds formed of hot dung, sunk under ground in the warmest and most sheltered parts of gardens, particularly round London, where immense quantities are annually grown for the market. The best sorts for this mode of culture are the small Early Cantaleups, as they require less heat to ripen them, and are withal much hardier than most other sorts. These usually fruit in the latter end of July, August, and September, and therefore should be sown from the middle of March to the middle of April: their sowing, transplanting, &c., is the same as that already noticed for the earlier crops, only we would recommend potting them either in larger pots, in the first instance, than is usually done, or to shift them after they have filled their first pots with roots, or even to plant them into small wicker-baskets made on purpose, and not closely plaited, so as to facilitate the escape of the roots when they are placed in their final destination. This is a very old plan, but, however, it has its advantages, as by this means a two or three-light frame, or even the sides of pits or frames, in which the earlier crops are coming on, will contain a great number of plants so treated, and occasion very little extra trouble or expense. By this method the plants will have attained a pretty large size, be stopped once, or perhaps twice, and even blossom be appearing on their laterals, by the time the season is sufficiently mild to admit of their being planted out on ridges of warm dung, and under the protection of hand-glasses.

The ridges or beds being prepared for them, if in pots, they are to be carefully turned out of them in the usual manner; if grown in baskets, they are set, still remaining in them, in the places where they are to remain; give a little water, draw the mould up round them, so as to completely cover the baskets, and set the hand-glasses over them. The roots will soon find their way through the basket-work, and in a week they will be as far advanced in circumstances as if they had been planted out three or four weeks earlier; thus enabling the cultivator to delay the final planting out until the season has become sufficiently advanced as to give him no uneasiness on the score of their being injured by late frosts, which in this country we are seldom exempt from till towards the latter end of May.

The routine of culture differs not from that already recommended. Water must be rather sparingly applied to them, and very rarely, if ever, near to their main stem.

Mr. Williams, of Pitmaston, has recommended their culture on sloping beds, covered with slates, and linings of weeds, short grass, or other refuse, applied behind them; and Mr. Greenshields, a most excellent gardener, has also grown them pretty successfully when planted at the bottom, and trained against a south wall.

Beds on which crops of early potatoes or other forced vegetables have been grown, are very fit whereon to plant melons for a moderately late crop; that is to say, to ripen during August or September. Immense quantities are annually produced by the London market gardeners, who merely form holes large enough to hold about a wheelbarrow full of hot dung; on these they plant the melon plants, and cover them with hand-glasses for the first two or three weeks, or rather until the vines extend beyond the limits of the glasses, when they cover them with frames which have been used for other purposes during the early part of the spring; and by this means they produce excellent fruit with no other heat than that of the sun, which they husband with great care, especially towards afternoon, when they shut up early, inclosing as much heated air as possible, so as to keep up a genial heat during the night. In cultivating melons without bottom heat, much less water should be given than when there is heat under them; and also the greatest care should be taken that no water be given to them when the external temperature is low, or in times of rain.

INSECTS AND DISEASES.—The diseases are those which arise chiefly from improper soil, too much as well as too little water, and a deficiency of heat; and consequently an impure atmosphere, which produces mildew on the foliage, and canker in the branches, and frequently on the fruit also.

The insect enemies are the acarus, thrips, and the aphides.

It is probable that the two first have their origin in too dry an atmosphere, and the latter in too cold a temperature. Heat and moisture, therefore, appear to be the best remedy. Fumigation of tobacco will destroy the last of these; but we have often found the melon plants much injured by this application. Water, in general, destroys the acarus, and oftentimes the thrips also; but, unless there is a complete command of heat to be thrown into the pit or bed at the same time, there is a danger in its too liberal application. Sulphur and a variety of other remedies have been recommended without much apparent effect. As remedies, we think, if the fumes of camphor, or of other innocuous gas, could be injected into the frames, and there closely shut up, that they would be found beneficial; but as preventatives, which are always better than even the most complete cures, we hesitate not to say, that if the maintenance of abundance of heat, moisture, and fresh air, which are the elements constituting the proper food of plants, be strictly attended to, neither disease nor insects will attack them; and should any of these make their appearance, it may be taken for granted that one or other of these elements is insufficiently supplied.

THE BLACK MULBERRY.

The Black Mulberry is a native of Persia, and is supposed to have been introduced into Europe by the Romans. At what period it was brought to Britain is rather uncertain. It is mentioned by Tusser and Gerarde, both of whom wrote between 1550 and 1596; and Phillips states, but without quoting his authority, that it was introduced in the year 1548, and first planted in the gardens at Sion House, where the trees are said still to remain, but in so great a state of decay as to require to be propped up; notwithstanding which, the foliage and fruit are as luxuriant as that upon young trees: the nourishment is supplied through the bark, the whole of the woody part of the stem being decayed. Forsyth observes, that there is reason to believe that they were introduced at a much earlier period than that quoted above, as many old trees are to be seen standing about ancient monasteries and abbeys, which would prove their introduction to have been prior to the dissolution of these houses in the time of Henry VIII.

About the year 1600, James I. greatly encouraged the planting of mulberry trees, and many planted at that time still exist in old gardens. It would appear that the object of this monarch was more with a view to provide food for silkworms than for the production of fruit, for about that time the taste for articles of silk manufacture had become very great. Phillips informs us that in the year 1600 a special order was issued by that monarch for the planting of the first mulberry garden in England at Charlton Park, in Kent, under the direction of Mons. Vetron, a native of Picardy, and Matthew Stellendge, Esq., to whom a patent was granted for planting mulberry trees in all parts of England. "The motive was," he continues, "a hope that Britain, in a few years, might be able to keep the silk markets with her neighbours; and the scheme for awhile succeeded; and so sedulous were the king and his whole royal family in feeding silkworms and preparing thread, that the queen had silk enough of her own winding to make many yards of taffeta, which being wrought into proper garments, her majesty, on the king's birthday, appeared at court in a complete suit, all the effect of her majesty's own industry. The prosperity of the royal scheme was beyond all expectation; but upon a warm representation of the merchants respecting the impolicy of checking the imports, and other causes likely to arise, the pursuit declined as rapidly as it had advanced, and in a very short time not a public silk-work was to be seen, except at this place, Charlton Park, where they had there commenced it. These identical trees were cut down and sold by auction in 1821, and the timber was in fine preservation, although of two centuries' vegetation."

No attempt appears to have been made in Britain to revive the production of silk, as an article of native growth, until about sixteen years ago, when a company was formed, and measures taken to cultivate the silkworm; but whether from the unfavourable state of the climate, or the breeding of the insects not being properly understood, the scheme was, after some years' trial, entirely abandoned. Our own opinion is, that native labour is far too expensive in the present state of society to admit of success in the production of an article which can always be imported of better quality and at a much cheaper rate than it can be produced at home.

The White Mulberry is extensively cultivated by the Chinese for the production of silk, and is a native of that country. It is, however, much more tender than the Black Mulberry, and is in every respect better adapted for the purpose. The Black Mulberry is sufficiently hardy to withstand our winters without injury, and is remarkable for putting out its leaves so late in the season as May, a circumstance which has led gardeners to take for granted that all danger from frost is past when the leaves of this tree are of the size of a sixpence. The mulberry tree is not only highly valued by many as a fruit-bearing tree, but is also exceedingly ornamental when planted on the lawn or shrubbery, and is one of the very few trees that will flourish in the vicinity of the sea. It is, however, by no means so generally planted in this country as its merits deserve.

It is pretty generally admitted that the Chinese were the first who turned the web of the silkworm to a useful account, and they, together with the Persians, for ages exclusively supplied all the rest of the world with silk. Madame de Genlis, in her work *La Botanique, Historique, et Littéraire*, &c., says that the Empress Siling Chi, wife to Hoamti, at the request of her husband, examined the silkworms with a view to turn their web into some useful account, and that after various experiments she succeeded in discovering the means of winding the silk, and even the making of silk stuffs, which she embroidered with flowers and birds. From China and Persia the silkworm and mulberry tree were introduced into Greece and Italy, where the tree was extensively cultivated, and silk garments manufactured. The effeminate Heliogabalus wore a robe of silk as early as the year 220, and the Emperor Aurelian, one of his immediate successors, denied his wife a robe of silk because it was too expensive.

The first silk seen in Britain was a belt and two vests, presented by Charlemagne to Offa, king of Mercia, in 780; and it is recorded as an instance of the luxury of the age, that some noblemen's ladies wore silk mantles at a ball given at Kenilworth Castle, in 1286. About 1534, the English clergy first began to wear silken vestments; and Henry VIII. received as a present of no small importance a few pair of silk stockings from Spain; but knit silk stockings were not known here until they were made by Mrs. Montague, who presented the first pair to Queen Elizabeth. During the long and propitious reign of that queen, a trade was opened with Persia in raw silk; and the English are said to have derived immense profits in silk speculations, as they had the exclusive privilege of importing all manner of foreign commodities into Russia.

In 1661, Evelyn informs us (*vide* his *Diary*), that he had visited a wonderful machine for weaving silk stockings, which was the invention of an Oxford scholar forty years prior to his time. This proves to us how far the art of silk weaving had advanced at that early period. Sir Thomas Lombe, in 1714, erected the celebrated silk mill at Derby, from a model he had contrived to make from an engine used for this purpose in Savoy, and for which he obtained a patent in 1718. In 1732, His Majesty gave his assent to the bill for granting £14,000 to Sir Thomas Lombe, as a recompence for his ingenuity in introducing this curious machine.

The establishment of the silk manufactory in England owes its rise to the want of policy and good government in France, whose industrious artizans were driven from their homes solely on account of a difference of opinion in religious matters, and were compelled to seek protection from us. Many of them settled in Spitalfields, where to this day their descendants continue to manufacture silk.

The medicinal properties of the Mulberry are, perhaps, not of sufficient importance to gain its admission into our pharmacopœias: the fruit is, however, cooling, and rather laxative; and, as it does not undergo the acetous fermentation, is a proper fruit for those affected with gout and rheumatic diseases to indulge in. So efficacious did the ancients think this fruit in cases of gout, that Hexander, in Athæneus, affirmed that the mulberry tree in his time did not bring forth fruit for twenty years together; and that so great a plague of the gout raged, and so generally, that not only men, but boys, wenches, eunuchs, and women, were troubled with the disase. Mulberry wine, which is palatable to many persons, is made from the fruit, and a syrup is obtained from the unripe berries, useful in cases of ulcerated sore-throats. The root of the tree has an acrid bitter taste, and has been used, it is said, with great advantage, in cases of worms, particularly the tape-worm.

SELECT LIST OF MULBERRIES.

The Garden or Black Mulberry is the only species that is cultivated as a fruit-bearing tree.

PROPAGATION.

The Mulberry is propagated by seeds, cuttings, grafting, and laying, and sometimes by suckers, which rise from the bottom part of the stem or trunk.

Seeds.—This mode of propagation is certainly the most unsatisfactory, when the object is to procure fruit-bearing trees, as a considerable proportion of such are without female flowers, and consequently produce no fruit. If the object be merely to originate trees for feeding silk-worms, seedling trees may answer every useful purpose.

Cuttings.—The wood of this tree will strike root at any age, and of any size. It has been asserted by a correspondent in the *Gard. Mag.*, vol. v. p. 63, that "any branch with the smaller shoots removed, and firmly inserted in the ground like a post, will shoot luxuriantly the first year, and in three or four years afterwards produce abundance of fruit. It appears that, by placing such truncheons or branches on the ground, and allowing them to remain some months in a horizontal position, they will succeed better when afterwards planted upright." The usual mode, however, is to make choice of the shoots of the former year's growth, having a small portion of the preceding year's wood at their base. These are taken off, and planted in rows about one foot asunder, either in autumn or in spring, leaving only two or three buds above ground. The ground between the rows should be kept moist by mulching for the first season, at the end of which many of the cuttings will have struck root, and the remainder the season following. When they have struck root they should be planted out in nursery lines, three feet apart, and eighteen inches distant in the line. The oftener young trees of this kind are transplanted, while in the nursery, the better will they be in a fit state for final removal.

Grafting.—The late T. A. Knight, Esq., propagated the Mulberry by grafting, and has detailed his practice in the *Transactions of the Horticultural Society of London*, vol. i. p. 60. This is a very excellent mode, where, for example, a sufficiency of stocks may have been originated from seeds. These are placed in pots, or planted in the ground, sufficiently near a bearing tree, so that the branches may be brought into contact with the young stocks, and united by enarching, for it seldom succeeds by the common mode of independent grafting. Trees so treated will produce fruit the third or fourth year after the operation.

Laying.—According to Forsyth, the best bearing branches of old trees are to be chosen for laying, and these will generally take root the first year; so that they may be separated from the parent tree, when they should be planted out in nursery lines, and trained up to one stem. The late Mr. Knight frequently laid the branches into pots, elevated upon posts, and by this means had fruitful plants the second or third year after laying.

Suckers.—This mode, like that of originating them by seeds, is not to be recommended, as trees so produced are much longer in coming into a bearing state.

Soil.—The Mulberry requires a deep, moist, and rich soil; and, where that is not naturally the case, manure and humidity must be supplied by artificial means.

Planting.—The Mulberry is usually planted as a standard in orchards or on lawns, where the surface under the branches is covered with grass, upon which the fruit, when ripe, falls without injury. They are also not unfrequently planted against walls, where the climate is not warm enough to mature the fruit. In this latter case, the surface of the ground at the bottom of the wall may be covered with moss for the fruit to fall upon. There can, we think, be little doubt of the propriety of allowing the fruit to fall of itself, and also that it should fall upon a soft surface, for, as Abercrombie observes, "So nice is the criterion of perfect ripeness, that berries falling without damage are superior to those gathered. Besides, a grass surface harmonizes best with trees of magnitude, and increases the beauty of a rural scene." Williams, of Pitmaston, is the only authority we have consulted who differs from this opinion. "The standard mulberry," he says, "receives great injury by being planted on grass plots, with the view of preserving the fruit when it falls spontaneously. No tree, perhaps, receives more benefit from the spade and the dung-hill than the mulberry; it ought, therefore, to be frequently dug about the roots, and occasionally assisted with manure. The ground under the tree should be kept clear from weeds during summer, particularly when the fruit is ripening, as the reflected light and heat from the bare surface of the soil is thus increased; more especially if the ends of the branches be kept pruned, so as not to bower over too near to and shade the ground." Mr. George Lindley recommends the following routine of culture:— "When the tree has been planted a year, and got firm hold of the soil, the branches should be cut down to three or four inches, from each of which two or three clean straight shoots will probably be produced. In August four of the strongest and best placed should be selected, and the rest cut out; thus giving the remaining ones a better chance of extending their length, and of ripening their extremities: besides, with a little additional trouble, if the shoots should not be so well placed as could be wished, their situation can be altered at pleasure, by laying them to small sticks fixed in the head for that purpose. In the following spring, if the four should be of an equal length, they must not be shortened; but if one or two be much longer than the others, they must be reduced to the same length, and allowed to grow for another year, when the head should be thinned out, leaving as many of the best-placed shoots as will form the head. This being completed, nothing further will be required than to examine the head from year to year, giving advantage to the leading shoots, cutting out close all redundant ones, and those likely to injure one another. As this sort of fruit is always the largest and best flavoured where the trees are kept thin of wood, their neglect will consequently diminish its value, without enlarging its quantity." Few fruit trees are more neglected in regard to pruning than the Mulberry; indeed, it is seldom thought of; but if those possessed of a tree of this kind were to bestow upon it the necessary thinning and arrangement of its branches which is required, the abundance and superiority of its fruit would amply repay them for the little trouble.

Knight, Williams, and others have recommended the Mulberry to be planted against a south wall, particularly in cold situations, but we may here observe, that this has been practised for more than a century, and some very aged trees are occasionally to be met with so treated, and also trained as an espalier upon the horizontal principle, which appears to be the best mode of training for this tree.

PRUNING.—The season for pruning is in spring, when the blossom buds can be readily distinguished from the others, which would be almost impossible during winter, and the routine is to pinch off every barren shoot which is not wanted to cover the wall, and stop every bearing shoot under similar circumstances, at the third or fourth leaf. Redundant or ill-placed branches are to be removed, as are those also which have become diseased and unproductive, endeavouring always to keep up a succession of young wood, as being that from which the crop is to be expected.

DISEASES.—We are not aware that disease or insects of any description attack the Mulberry in this country, and this appears to have been the opinion of the celebrated Evelyn, who says that this tree possesses the peculiar property of breeding no vermin, neither does it harbour any caterpillar except the silkworm.

FORCING.—That zealous and enlightened horticulturist, the late T. A. Knight, Esq., was, we believe, the first who attempted to force this fruit, and he has published the results of his experiments in the *Transactions of the Horticultural Society*, from which we make the following extract:—"The Mulberry is a much finer fruit when ripened under glass in the north of Herefordshire than in the open air, and in the still colder parts of England it is probably the only means by which it can be ripened at all. The culture of this fruit by me, under glass, has been confined to plants grown in pots; but I am not acquainted with any species of fruit tree which, under such circumstances, produces more abundantly, or which requires less care. Its blossoms set equally well in different degrees of heat, and the same continued temperature which will ripen early varieties of the grape in the end of July, will afford perfectly ripe mulberries early in June; and a tree of the latter species, when fully loaded with fruit, presents at least as agreeable an object to the eye as many plants which are cultivated as ornaments only. It is not subject under common care to any disease or injury, except the attacks of the red spider, and as the foliage and growing fruit of the mulberry tree are not at all injured by being wetted every evening with clear water, the red spider can never prove a very formidable enemy."

To those desirous of forcing the Mulberry, we would recommend having two or three trees grown in large pots or boxes, and placing them in January in a spare place of a vinery, or cherry house, giving them a soil of the richest description, and keeping them rather moist than otherwise.

THE NECTARINE.

The Nectarine, like the peach, is a native of Persia, and was introduced into Britain about the year 1524. It was brought into Italy direct from Persia, by the Romans, in the reign of Claudius, and has been described, both by Columella and Pliny, as an admired fruit in their time. The name Nectarine is said to have been given to it as expressive of its peculiar value, or as if it was food for the gods, nectar being their beverage. In early times it was not specifically distinguished from the peach, which it resembles in every particular, except in the smoothness of its skin; and modern botanists have fully determined that it is not only merely a variety of that fruit, but have recorded several instances of both peaches and nectarines growing upon the same tree. It is highly probable from the writings of Gerard, who flourished about the period of its introduction, that several varieties of peaches, and perhaps nectarines also, were introduced at the same time. In his valuable *History of Plants*, written about thirty-five years after the date of its introduction, he describes four kinds of peaches, and informs us that he had them all growing in his own garden, besides many other sorts.

The fruit of the Nectarine is much higher flavoured than the peach, and is capable of being preserved in a ripe state longer: it will also bear carriage much better than the latter fruit.

The author of "The Seasons" has thus described this fruit:—

> " ———— As I steal along the sunny wall,
> Where autumn basks with fruit empurpled deep,
> My pleasing theme continual prompts my thought;
> Presents the downy peach, the shining plum,
> The ruddy, fragrant nectarine, and, dark
> Beneath his ample leaf, the luscious fig."

SELECT LIST OF NECTARINES.

1. **Fairchild's Early.**—Originated by a person of that name in the neighbourhood of London, and author of *The City Gardener*, published in 1722. Size, small; form, nearly round, flattened a little at the apex; colour, deep red next the sun, yellowish where shaded; flowers, large; leaves, crenated; glands, kidney-shaped; pulp, yellow; flavour, rich; stone, nearly smooth; ripens in the neighbourhood of London about the middle of August.

2. Newington. [*Syn.*, Sion Hill, Rough Roman, Scarlet Newington, Old Newington, Anderson's, Anderson's Round, Smith's Newington, Brugnon de Newington d'Angleterre.]—Size, rather above medium; colour, bright red next the sun, palish next the wall; flowers, large; leaves without glands, and doubly toothed; pulp, palish yellow, red next the stone; flavour, very excellent; stone, small, slightly rugged; ripens in the south of England about the beginning of September; cling-stone; tree, healthy, and an excellent bearer, both on the open walls, and also in the forcing house; leaves, large, and wood longer and more slender than in others of its class.

3. Early Newington. [*Syn.*, Black, Lucombe's Black, Lucombe's Seedling, New Early Newington, New Dark Newington, Early Black Newington, Early Black.] —Size, rather below the medium; colour, bright red where fully exposed, often marbled with a darker colour, greenish white where shaded; flowers, large; leaves, without glands, doubly toothed; pulp, greenish white, very red towards the stone; flavour, excellent; form, ovalish, slightly compressed on one side; stone, smallish; ripens in the neighbourhood of London about the beginning of September; cling-stone. From the above it will appear that great confusion has hitherto existed in regard to the varieties of nectarines cultivated under the name of Newingtons, which has no doubt arisen from the many seedlings originated within the last half century.

4. Elruge. [*Syn.*, Common Elruge, Oatlands, Claremont, Temple, Elrouge, Miller's Elruge.]—Said to have originated with one Gurle or Gourle, a nurseryman of Hoxton, according to Forsyth, and of Hoddesdon, in Hertfordshire, according to Lindley, in the time of Charles II., who gave it this name as a kind of anagram of his own name. The name of Claremont was attached to it, either through variety, design, or ignorance, by Greening, gardener to the Duke of Newcastle while proprietor of that place. If we are wrong in ascribing the confusion which arises in this case, in regard to names, to its true cause, we can only admit that Mr. Greening had raised a seedling from the kernel of the Elruge, which he supposed to be somewhat different from the parent, or from any other nectarine with which he was acquainted, and called it after the place where he then lived; for certainly no doubt can exist as to the fact of the Claremont and Elruge being the same fruit. Messrs. Lindley and Rogers, as well as most writers on fruits prior to their time, describe them as distinct; but Mr. Robert Thompson, who has had ample opportunity, and is unquestionably the highest pomological authority of the present day, positively asserts them to be the same. Our own observations have been directed for the last ten years to the same subject, and we now perfectly agree with him in his decision. We ought to remark, *en passant*, that Rogers does not appear very satisfied upon this subject; for, although he describes them as different, he adds, "This," that is, the Claremont Nectarine, "and the Elruge are so nearly alike in all their characters, that a description would be only a repetition: the only difference is in the time of ripening, the Elruge coming a few days earlier." Size, medium; colour, deep red, where fully exposed, interspersed with dark-brownish russet, pale-greenish where shaded; flowers, small; leaves, crenated; glands, kidney-shaped; pulp, whitish, red towards the stone; flavour, excellent; form, inclining to oval; stone, largish; ripens in the neighbourhood of London about the beginning of September; free-stone;

tree, healthy, and an excellent bearer, either on the open wall, or in the forcing-house.

5. Hunt's Tawny. [*Syn.*, Hunt's Early Tawny, Hunt's Small Tawny.]—Size, under the medium; colour, yellowish orange, tinged with deep red, where fully exposed, palish orange on the shaded side; flowers, small, rose-coloured; leaves, without glands, and doubly toothed; pulp, deep orange; flavour, exceedingly good; ripens in the neighbourhood of London about the beginning of August; free-stone.

6. Hunt's Large Tawny.—Originated with a person of this name, in 1824, under the following extraordinary circumstances, as related by Mr. Lindley. "This excellent nectarine," he says, "originated from the 'Fairchild's,' not through the seminal process, but, as it appears, by a spontaneous effort in nature to enlarge the parts of fructification. In the spring of 1826 I observed a few of the modern plants in the nursery with much larger blossoms than those of the other plants, but promiscuously intermixed amongst them; which at first led me to suppose that some other sort had been introduced through the carelessness of the budders in the previous budding season; but, upon a close examination, I found there was not in the whole collection of peaches and nectarines then in flower one kind whose blossoms corresponded with these. I marked the plants, and in the autumn had two or three potted of each sort. In 1828, I placed them under glass, and forced them: their blossoms still maintained their enlarged character, and were succeeded by fruit which differed in no other respect from the original sort than that of being larger, yet ripening about the same time. There appears to me," he continues, "a great singularity in this accidental change of character, and to some it may appear incredible; but I state it as a fact that has happened under my own inspection, being perfectly satisfied that it had never been observed previously by any other person. There are other instances on record," as Mr. Lindley observes, "where a fruit has spontaneously changed its character; but none so decidedly as this, which has enlarged its blossoms, as well as its fruit. Mr. Knight states, in the second volume of the *Hort. Trans.*, p. 160, that he has a tree of the White Magnum Bonum plum forty years old, which last year produced on one of its branches *red* fruit, perfectly like the Red Magnum Bonum; but this change was not permanent. He had also a May Duke Cherry, which, some years ago, on one of its branches, had constantly oblong fruit, ripened later, and were of greater weight than those of the other part of the tree. These, with many other instances of spontaneous production which might be enumerated, lead me to conclude that we may possibly have other varieties, both of plants and fruits, which have not originated from seed." A similar singular circumstance occurred the year before last, in the Claremont Garden, of a pear tree, which we had received from Germany, and which was remarkable for the earliness of its ripening and smallness of its fruit, which only lasted a few days fit for use, produced from one of its branches pears three times the size of the general crop, and, strange to say, kept not only sound till the September following, although left upon a shelf in a room, where there was very frequently a fire kept up. But, to return to the description of Hunt's Large Tawny Nectarine. Size, under the medium; colour, pale yellow, mottled with red on the side most exposed to the sun; flowers, large; leaves, without glands, doubly toothed; pulp, deep orange; flavour, excellent; ripens in the neigh-

bourhood of London about the end of August; form, oval, slightly compressed on one side; tree, hardy, and an excellent bearer, but scarcely worth a place in a peach-house, as there are so many that are superior. Indeed, although it is well worthy of a wall as an early and hardy fruit, our principal motive for introducing it in this list is to draw the attention of fruit cultivators to the study of the causes of the phenomena stated above.

7. Roman. [*Syn.*, Red Roman, Old Roman, Brugnon Violet musque, Brugnon musque.]—One of our best and longest cultivated sorts. It is enumerated by Parkinson in his list, published in 1629, but is now rather rare in nursery collections. It was highly prized in France in the time of Quintynaie and Duhamel. Size, one of the largest; colour, deep red or purple, with a brownish russet covering on the side next the sun, yellowish green where shaded; flowers, large; leaves, crenated, with kidney-shaped glands; pulp, greenish yellow, red at the stone; flavour, excellent; ripens in the neighbourhood of London about the middle of September; cling-stone; tree, healthy, and an excellent bearer, either in the peach-house or the open walls.

8. Pitmaston Orange.—Originated with John Williams, Esq., of Pitmaston, in 1815, from a kernel of the Elruge. Size, about the medium; colour, dark, brownish red on the sunny side, rich yellow on the shaded side; form, almost heart-shaped; flowers, large; leaves, crenated; glands, globular; pulp, orange-coloured; flavour, excellent; ripens in the neighbourhood of London about the middle of August; stone, small, sharp-pointed, and very rugged.

9. Golden. [*Syn.*, Orange.]—Fine gold fleshed; size, rather above the medium; colour, bright orange next the wall, bright scarlet with a few streaks of red on the side next the sun; form, oval; flowers, small; leaves, crenated; glands, kidney-shaped; pulp, yellow, reddish near the stone; flavour, good; ripens in the neighbourhood of London about the middle of September; cling-stone; tree, healthy, and a pretty good bearer.

10. Peterborough.—[*Syn.*, Vermash, Late Green, Genoa.]—Introduced by Lord Peterborough from Genoa, hence two of its names, and probably at some other period it had been introduced from France, which would account for the third name, viz., Vermash, a name evidently of French derivation, from *Ver machi.* Size, perhaps rather under medium; colour, pale green, with muddy red on the side exposed to the wall, pale green next to the wall; leaves, slightly sawed; flowers, small; form, round; pulp, greenish; flavour, about ordinary; ripens in the neighbourhood of London about the beginning of October; free-stone.

11. Old White.—Introduced by Sir A. Pytches, of Streatham, from Asia, about sixty years ago; but as Parkinson, in 1629, mentions a white nectarine, some doubts are entertained whether there was another, or whether it could have been the same. Size, medium; colour, pale yellowish white; form, nearly oval; pulp, white; free-stone; flowers, large; leaves, crenated; glands, kidney shaped; ripens in the neighbourhood of London about the middle of September. This is rather a rare nectarine; Rogers says it was at first solely propagated, because it requires an almond stock; and Lindley observes that he found difficulty in propagating it, because it requires to be budded upon some hardy peach. When the Minion stock was introduced, it grew readily upon it; but the trees thus raised were found to be but of short duration.

12. New White. [*Syn.*, Flanders White, Neate's White, Emmerton's New White.]—Originated, according to Lindley, with the Rev. Mr. Neate, at Whetstone, near

London, from a kernel of the Old White, about fifty years ago. Mr. Emmerton, a nurseryman at Barnet, received it from Mr. Neate, hence the origin of two of the synonymes. This sort takes freely on the Mussel stock, which the Old White refuses to do: this is one of the best tests to prove them distinct kinds, which some pomologists assert to be the case. Size, medium; form, nearly round; colour, almost white in the shade, rather inclined to greenish white, with a slight tinge of red where exposed to the sun; flowers, large, bright red; leaves, large and crenated; glands, kidney-shaped; pulp, tender, and very juicy; flavour, good; stone, small; free-stone; ripens in the neghbourhood of London about the middle of September; tree, healthy, and less subject to mildew than any other, and is also an abundant bearer.

13. Violet Hative. [*Syn.*, Violet, Violette hative, Petite Violette hative, Early Violet, New Scarlet, Large Scarlet, Hampton Court, Vermash of some authors, Lord Selsey's Elruge.]—Of French origin, but has been long cultivated in this country. Size, medium; colour, dark, purplish red where most exposed, yellowish green where shaded; leaves, crenated; flowers, small, bright red; glands, kidney-shaped; pulp, yellowish green, tinged with red; flavour, rich; stone, roundish and of medium size; free-stone; ripens about the middle of September; tree, healthy, and a good bearer, either on the open wall or in the peach-house.

14. Late Yellow. [*Syn.*, Rousanne, Morfin, Jaune lisse, Jaune lisse tardive.]—Of this fruit we know but little from our own experience, farther than having seen the fruit in the gardens of the London Horticultural Society, and having had a high character given of it.

15. Brinion. [*Syn.*, Violet red at stone, Marbled, Brinion red at stone, Italian of some pomologists, often written, though erroneously, Brugnon, as if it was derived from *Brugnon*, a term used by the French for clingstones in general, whereas it comes from *Brin*, a brindled or marbled colour.]—Size, the very largest of our melting nectarines; colour, dark red, marbled with a still darker colour on the sunny side, palish yellow in the shade; flowers, small; leaves crenated; glands, kidney-shaped; pulp, greenish yellow; flavour, excellent; free-stone; tree, healthy, an excellent bearer, either in the peach-house or on the open wall.

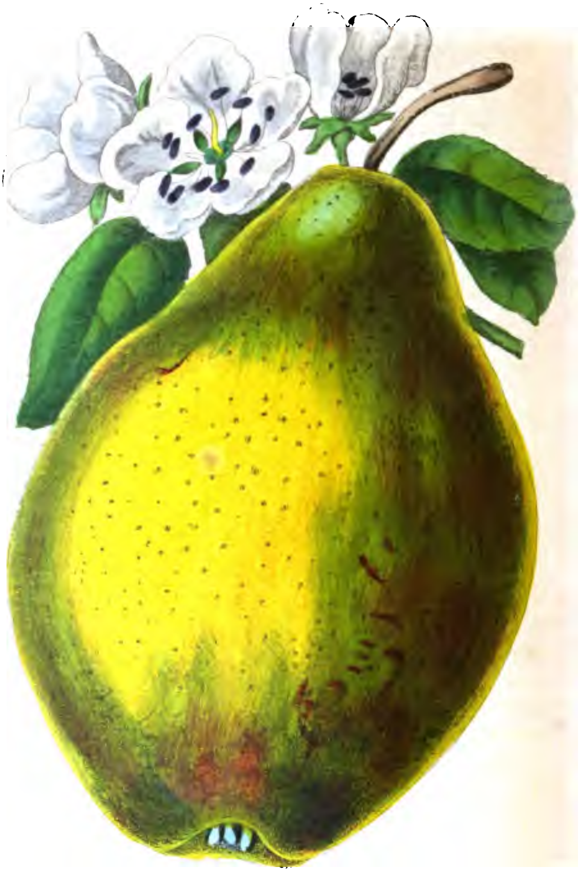
16. Duc de Tello. [*Syn.*, Dutilly, Duc Telliers, Du de Telliers.]—Introduced by M. Dutilly Gerrardet, a Dutch merchant, who according to Rogers settled at Putney, in Surrey. From him it found its way to Mr. Hunt, who first established the nursery there, and which has lately been broken up. This Hunt, and Gray, of Fulham, were great assistants to Miller in bringing out his dictionary. Size, above medium; flowers, small; leaves, crenated; glands, kidney-shaped; form, somewhat oblong, narrowing towards one end; colour, dark red on the side exposed to the sun, light greenish on the shaded side; pulp, greenish white; flavour, exceedingly rich; free-stone; tree, delicate in growth, which disposition is increased by its being an abundant bearer. Rogers says it weakens itself by producing a profusion of bloom. However, it deserves a place in every garden. Ripens in the neighbourhood of London about the beginning of September. It succeeds best when budded on the pear or plum stock.

17. Vermash. Most likely of French origin, as Hooker states, in Pomona Londinensis, and not unlikely the name is derived from *ver machi*, although the

French pomologists have given us no published account of any nectarine according with this fruit. Size, under medium; colour, very red next the sun, greenish on the other side; flowers, large; leaves, crenulated; glands, kidney-shaped; pulp, white, very red next the stone; flavour, good; stone, small; free-stone; ripens in the neighbourhood of London about the end of August; tree, tender, but well-adapted for a forcing-house.

For propagation, planting, pruning, and general management of the Nectarine, *see* PEACH.

PEAR



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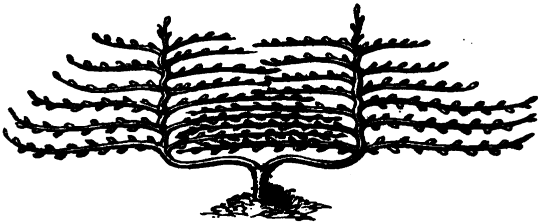


THE PEAR.

The Pear may be considered, in point of merit, as a British fruit, to rank next to the Apple. At what period or in what manner the Pear became first known to the inhabitants of this country, is equally obscure and uncertain as the origin of the apple. In its wild state, like that fruit, it is found in our woods, and growing in almost any soil. The Romans are known to have been possessed of thirty-six varieties even in the time of Pliny, a greater number than they had of the apple, which leaves us to conjecture that, like the modern inhabitants of Italy, they were more partial to this fruit than to the apple. If the Pear was not introduced by this people, who held the fruit in such estimation, it will be difficult to account for such an omission, as we are informed by Tacitus that the soil of Britain was found to be fit for all kinds of fruit trees, the vine and olive excepted, and Pliny distinctly says that cherries were introduced here about the middle of the first century, having only been brought to Italy a century before. It is, therefore, within the limits of probability to suppose the Pear to have been also brought at that period, as the Romans were accustomed to introduce their luxuries wherever they extended their power. Whether the Pear, if introduced by the Romans, continued to exist in this country during the dark ages, we know not: but if it did not, we must conclude that it was reintroduced by the ecclesiastics soon after they had established themselves in the country, for we find it was extensively cultivated during the days of monastic splendour, in the twelfth, thirteenth, fourteenth, and fifteenth centuries: the remains of many of the orchards of the monks exist to the present day.

It is, however, from about the beginning of the sixteenth century that we can at this distant period find any certain records of this fruit, although trees exist which originated long prior to that date.

The Peàr is a much more hardy and durable tree than the apple, and although longer in coming into a fruit-bearing state, will exist for centuries, and still keep its health, productiveness, and vigour. From the fermented juice of the Pear perry is made; the wood is solid and light, much used by turners, and for making joiners' tools. The leaves dye yellow, and are also used to give a green to blue cloths.

Varieties.—Tusser, in 1573, mentions Pears of all sorts; Parkinson enumerates sixty-four sorts; Miller has selected eighty sorts; Salisbury enumerates thirty as being in general cultivation; Forsyth describes seventy-five; Lindley describes one hundred and sixty-two; Rogers describes fifty-two; Encyclopædia of Gardening, new edition, describes sixty-two. The Nursery Catalogues contain the names of two or three hundred, and the Fruit Catalogue of the Horticultural Society an immense number of names, a very large portion of which are either little known or unworthy of cultivation.

SELECT LIST OF PEARS.

1. Alexandre de Russie.—Introduced from Flanders by the Horticultural Society, in whose garden it fruited for the first time, in 1830. Size, above medium; form, somewhat obliquely pyramidal; colour, greenish yellow, nearly all covered with grey russet; eye, open; stalk, short and thick; flesh, white, rather gritty; flavour, sweet, with a slight perfume; duration, in October; habit, hardy, and well-calculated for a standard orchard tree.
2. Ambrette. [*Syn.*, Belle Gabrielle, Trompe Valet, Amber gris, Ambrette d'Hiver, Ambrette grise.]—Originated from France. Size, medium; form, nearly round; colour, russet; eye, small; stalk, long and stout; flavour, sweet and musky; duration, from November till January; habit, productive as a standard.
3. Angelique de Bordeaux. [*Syn.*, Saint Martial, Poire Angelique, St. Marcel, gros Franc real.]—Introduced about the beginning of the last century from

France, by the Duke of Montague, and planted in his garden at Ditton Park. Size, above medium; form, somewhat conical; colour, yellow on the shaded side, slightly purple on that most exposed to the sun; stalk, long, strong, and often crooked; eye, small; flavour, rich; duration, from February to April; habit, rather tender for a full standard, requiring a wall, and succeeding better on the pear stock than on any other.

4. Angelique de Rome.—Introduced from the Continent. Size, medium; form, conical; colour, pale yellow, tinged with red next the sun; eye, very small; stalk, of moderate length; flesh, yellowish; flavour, rich and agreeable; duration, from December till March; habit, healthy, but requires a good soil and situation; will succeed in such as a standard, but deserves a wall.

5. Ashton Town.—Originated many years ago at a village of that name in Cheshire. Size, medium; form, nearly round, slightly tapering towards the stalk; colour, greenish white, covered with many grey russet spots, rough, like a Crasanne, which it somewhat resembles; eye, small; stalk, of moderate length, slender, and straight; flavour, excellent; duration, in October; habit, "branches long, and rather slender, pensile, with a manner of twisting round in growing upwards; so that at a distance, when planted as a standard, it may be distinguished from every other sort."—*Lindley.*

6. Autumn Bergamot. [*Syn.*, York Bergamot, Common Bergamot.]—Introduced, it is conjectured, about the time of Julius Cæsar, and therefore one of our oldest varieties. Size, rather under medium; form, roundish, rather depressed at each end; colour, yellowish green, where shaded; dull brown sometimes, tinged with dirty red, on the most exposed side; eye, small; stalk, short and thick; flavour, exceedingly rich and sugary; duration, October; habit, one of the best fruits of its season, ripening well as a standard.

7. Autumn Colmar.—Introduced from Flanders by the Horticultural Society. Size, medium; form, conical, rather irregular in outline; colour, pale yellow, interspersed with many russety specks; eye, small; stalk, short and straight; flavour, rich, and slightly perfumed; duration, in October; habit, hardy, and bears well as a standard tree.

8. Belle Lucrative. [*Syn.*, Fondante d'Automne.]—Introduced from Flanders. Size, roundish, rather irregular in outline, and tapering a little towards the stalk; colour, palish yellow and green, slightly covered with russet; stalk, short, strong, and curved; eye, rather large; flavour, rich and perfumed; duration, October; habit, hardy, ripening well as an open standard.

9. Bellissime d'Automne. [*Syn.*, Vermilion.]—Originated on the Continent. Size, medium; form, conical; colour, yellow on the shaded side, red, with grey specks, next the sun; eye, deep; stalk, short and thick; flavour, excellent; duration, October; habit, hardy, and ripens on an open standard.

10. Bellissime d'Hiver. [*Syn.*, Teton de Venus.]—Originated on the Continent. Size, very large; form, quince shape; colour, yellowish brown on the shaded side, fine red on that next to the sun; eye, large; stalk, short and strong; duration, from November till April; habit, hardy, ripening on an open standard; exceedingly beautiful; one of our best baking pears, for which purpose it is better adapted than for the dessert.

11. Beurre Knox. — Introduced from Flanders. Size, above medium; form, oblong; colour, pale green, reddish brown towards the sun; eye, small; stalk,

short and crooked; duration, October and November; flavour, slightly sugary; habit, hardy, ripening on an open standard.

12. Beurre Rance. [*Syn.*, Hardenpont de Printemps, Beurre Epine.]—Originated with M. Hardenpont, at Mons, in Belgium, who, in conjunction with Dr. Van Mons, of Brussels, has greatly added to the number of our best pears. Size, medium; form, oblong, and tapering towards the stalk; colour, dark green, even when ripe; eye, small; stalk, of moderate length, rather slender; flavour, of the highest quality; duration, from December till April; habit, ripening to great perfection in many gardens near London, but merits a wall in most situations, as it is one of our very best pears. We may remark, that it generally shrivels in ripening, but is otherwise an excellent keeper.

13. Beurre Diel. [*Syn.*, Beurre royal, Beurre de Gelle.]—Originated with Dr. Van Mons, at Louvaine, in Belgium, and named by him in honour of Dr. Diel, a celebrated German pomologist. Size, large, when grown upon a wall, rather less when grown on a standard; form, oblong, tapering slightly towards the stalk, slightly angular on the sides; colour, dull lemon, interspersed with many grey specks; flesh, yellowish white; flavour, exceedingly rich and pleasant; duration, from November till January; habit, exceedingly prolific, whether grown against a wall, or as an open standard; but, although it will succeed well in favourable situations in the latter way, its great merits claim for it a south wall in most gardens.

14. Beurre d'Aremberg. [*Syn.*, Poire d'Aremberg, Duc d'Aremberg.]—Originated, it is conjectured, with M. Deschamps, an amateur cultivator in Belgium, and named in honour of the Duc d'Aremberg, a great encourager of horticulture. Size, rather above medium; form, conical; colour, pale green, changing when ripe to deep yellow; eye, small; stalk, short, straight, and strong; flavour, exceedingly rich and pleasant; duration, from October till February; habit, perfectly hardy, and ripening well on standards, espaliers, or against walls.

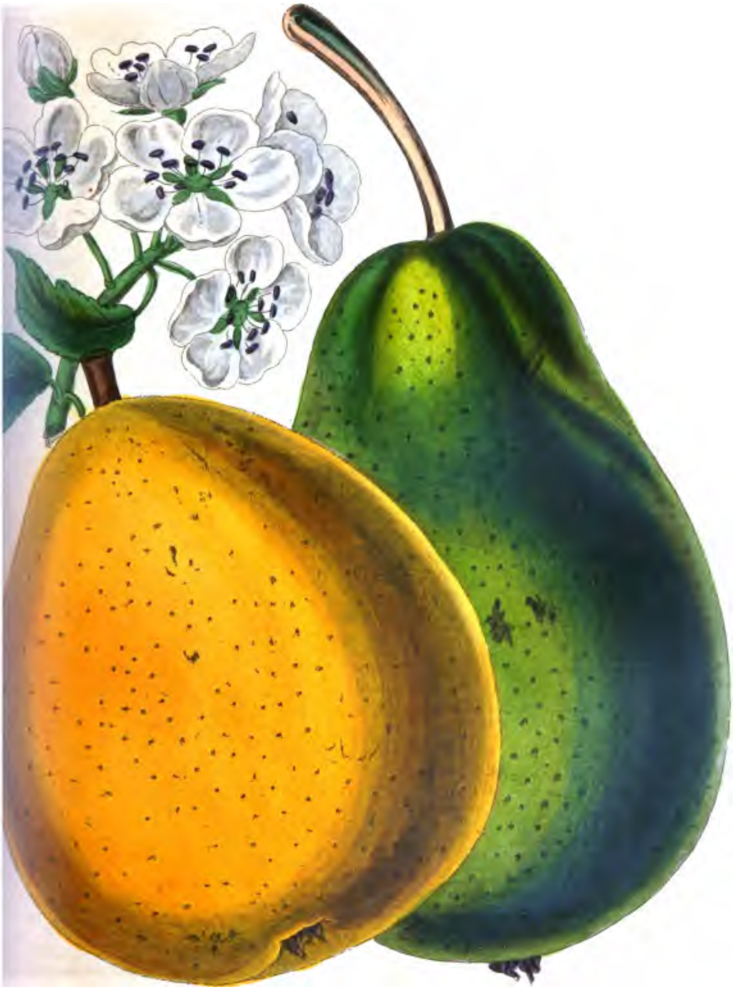
15. Bezy de Caissoy. [*Syn.*, Nutmeg Pear, Wilding of Caissoy, Petite Beurre d'Hiver, Bezy de Quessoy, Roussette d'Anjou.]—Originated in the Forest of Caissoy, in Bretagne. Size, small; form, oblong; colour, green, becoming yellow when ripe; eye, small; stalk, short; flavour, very rich; duration, from November till March; habit, hardy, and very productive, ripening well as a standard.

16. Bezy de la Motte. [*Syn.*, Beurre blanc de Jersey.]—Originated on the Continent. Size, above medium; form, roundish; colour, yellowish green, becoming yellow when ripe; eye, small; stalk, short, bent, and strong; flavour, rich and sugary; duration, in October and November; habit, hardy enough for a standard or espalier, and in either way very deserving of cultivation.

17. Bezy d'Heri. [*Syn.*, Besideri.]—Originated in the Forest of Heri, in Bretagne, in France, where it was found in a wild state. Size, medium; form, roundish oval; colour, greenish yellow on the shaded side, slightly tinged with red on the side next the sun; eye, open; stalk, short and slender; flavour, indifferent for the dessert, but bakes well; habit, hardy and productive as a standard tree. Must have been introduced here at an early period, for we find it enumerated in a MS. list of fruit trees, cultivated by Evelyn, at Sayes Court, in 1687.

18. Bezy de Montigne. [*Syn.*, Trouvé de Montigne.]—Originated in France.

PEARS. PL. 2



Doyenne Gris.

Beure Rance.

Size, medium; form, conical; colour, green, yellow when ripe; flavour, agreeable; duration, October; habit, hardy, ripening on standards or espaliers.

19. **Bezy Vaet.**—Originated with M. Parmentier, at Enghien, a town in Belgium, where M. Parmentier has a large collection of plants and fruits. Size, about medium; form, conical; colour, green, interspersed with many russety spots; eye, small; stalk, short; flavour, sweet and agreeable; duration, in November and part of December; habit, hardy, and ripens on a standard tree.

20. **Bonchretien Fondante.**—Originated in Flanders. Size, above medium; form, oblong; colour, pale green, much covered with deep russet specks; eye, small; stalk, moderate in length, stout, and curved; flavour, rich and agreeable; duration, in November, and part of December; habit, hardy, and ripens on standards or espaliers.

21. **Brown Beurre.** [*Syn.*, Beurre du Roi, Royal Beurre, Red and also Golden Beurre, Beurre gris, Beurre d'Or, Beurre rouge, Beurre doré, Beurre d'Anjou, Beurre d'Amboise, Beurre d'Ambleuse, Poire d'Amboise, Isambert.] —It is very justly remarked by Lindley, that "this highly esteemed and well-known pear has had many different names assigned to it, as will be seen by the synonyms above quoted; and it has probably many more. Those which relate to colour, such as grey, golden, and red, have originated from trees on different stocks, on different soils, and in different situations of climate and of aspect, which the practical gardener is well aware contribute materially not only to the colour of the pear, but of the apple and the peach. Other names, and of those not a few, arise from the locality of places where the fruit happens to be cultivated. The Beurre pear in France, as well as in this country, is esteemed the best of its season. It is, however, a very tender tree, and more frequently cankered than any other pear cultivated in English gardens: on this account alone it is absolutely necessary to plant it against a wall, upon a sound, dry soil, and against a south or south-east aspect. Without attending to these particulars, so necessary for the Brown Buerre Pear, all attempts to obtain fine and perfect specimens of fruit will be attended with disappointment." Size, large; form, oblong, tapering towards the stalk; colour, greenish yellow, covered with thin russet, darker brown or reddish on the side next the sun; eye, small; stalk, moderate in length, and stout; flavour, rich and excellent; duration, October and part of November; habit, tender, as already noticed.

22. **Capiaumont.** [*Syn.*, Beurre de Capiaumont.]—Originated with M. Capiaumont, of Mons, in Belgium. Size, medium; form, conical; colour, clear cinnamon in the shade, bright red on the sunny side; eye, not sunk; stalk, short; flavour, excellent; duration, in October; habit, hardy and productive; ripens well on a full standard, but better on an espalier or dwarf standard, and grafted on the quince stock.

23. **Catillac.**—Size, very large; form, somewhat quince-shaped; colour, yellow, with a red tinge on the side next the sun, when fully ripened, which is only the case in our best seasons; eye, small; stalk, short, stout, and crooked; duration, from December till April or May; habit, very hardy, and bears well on an open standard; not fit for the dessert, but one of the very best baking pears.

24. **Charles d'Autriche.**—Originated with Dr. Van Mons. Size, large; form,

nearly round, slightly convex, and irregular; colour, greenish yellow, slightly russeted, interspersed with many brownish specks; eye, shallow; stalk, short; flavour, rich and pleasant; duration, in November; habit, moderately strong; ripens as a standard, but requires the protection of a wall in most places. The fruit is both good and beautiful, and well worth cultivation.

25. Chaumontel. [*Syn.*, Besy de Chaumontelle, Beurre d'Hiver.]—Originated at Chaumontel, in the department of the Oise, in France: the original tree is said to have existed in good health so late as 1765. Size, large, if too many be not left on the tree, a circumstance which very often happens, as it is a very abundant bearer; form, oblong and irregular; colour, yellowish green where shaded, brown or purplish where most exposed to the sun; eye, small; stalk, short and thick; flavour, excellent; duration, from November till February; habit, very hardy, ripening well on standards, or as espaliers; but nevertheless no garden should be without one or more trees of it upon the best exposed walls. Our experience corresponds with the opinion of the French orchardists, who say that it succeeds best when planted in a light soil, and grafted on the quince stock. This fruit is produced in very high perfection in Jersey, and forms a very considerable article of their exports to this country. In alluding to the fine fruit of this pear grown in that island, Mr. Lindley observes, "that such specimens are not to be expected from gardeners in this country; but they may do a great deal towards accomplishing this object, by planting their trees on a good soil, and upon a favourable aspect; keeping them in a high state of health; training their branches ten or twelve inches apart; selecting and allowing only strong young spurs to remain; and thinning out the fruit, so that they shall not be nearer each other than the branches are apart." Thinning the fruit and branches is too little attended to; and we may add, that we have found much benefit from watering the trees copiously in dry weather during the time the fruit is swelling.

26. Colmar. [*Syn.*, Incomparable, Poire Manne, Bergamotte tardive.]—Size, large; form, pyramidal; colour, green, with many grey specks, becoming yellowish when fully ripe; eye, large; stalk, short, thick, and bent; flavour, exceedingly rich; duration, from November till January; habit, too tender for an open standard, besides, its great merit entitles it to a place on a south wall. "The tree reared on the pear stock is vigorous, requiring much room to extend itself, and should have the warmest aspect that can be afforded; and, if planted on a properly prepared border, it will prove a better bearer than it generally has credit for. Like some other sorts of pears, the Colmar takes readily on the quince; but the trees, though sooner fruitful, are not lasting, nor are the fruit so good, either for keeping or eating."—*Rogers.*

26. Crasanne. [*Syn.*, Beurre plat.]—Originated, no doubt, on the Continent; but at what period introduced here is not known: it must, however, have been early introduced, as it was well known to Langley and other early authors. Size, above the medium, when too many are not left on the tree, but small, when the crop is large; form, rather conical, but flattened at the ends, from which circumstance M. de la Quintinie says the name is derived, as if from *écrasé* (flattened or crushed); colour, greenish yellow, oftentimes covered with a very thick russety covering, sometimes only thinly covered with a netted grey russet; eye, small; stalk, moderately short, crooked, and slender; flavour, excellent; duration, from November till January; habit, not hardy

enough for a standard or espalier, but highly deserving of a south wall, as it is one of the very best fruits of its season.

28. Darimont.—Originated in Flanders, and introduced within these few years. Size, medium; form, oblong; colour, yellowish grey russet, interspersed with many rough specks; eye, small; stalk, moderately short; duration, part of September and October; flavour, rich and musky; habit, hardy, and ripens upon standards in the neighbourhood of London.

29. D'Auch. [*Syn.*, Poire d'Auch.]—Introduced about the beginning of the present century, by the Duke of Northumberland. Size, large; form, pyramidal, and in many respects resembling the Colmar, with which it is often confounded; colour, green, with many grey specks, becoming slightly yellow when fully ripe; eye, large; stalk, short; flavour, exceedingly rich; duration, from December till February; habit, too tender for a standard, but, like the Colmar, deserving of a southern wall.

30. Delices d'Ardenpont.—Originated in Flanders with M. Hardenpont of Mons. Size, pretty large; form, somewhat oblong, with an uneven surface; colour, pale yellow, with many russety dots; eye, small; stalk, short, thick, and bent; flavour, rich, and slightly perfumed; duration, October; habit, ripens as a standard tree.

31. Double-blossomed. [*Syn.*, Arménie.]—Enumerated in the Sayes Court Collection, in 1687. An excellent kitchen pear, and very desirable to plant as an ornamental tree. It often produces variegated leaves, and in that case the fruit is striped with red, yellow, and green; duration of the fruit, from November till May.

32. Double d'Automne.—Size, medium; form, roundish, tapering towards the stalk; colour, beautiful cinnamon russet, interspersed with many grey specks; eye, small; stalk, of moderate length; flavour, excellent; duration, October and November; habit, ripens as a standard, and is a tolerably good bearer.

33. Duchesse d'Angoulême.—Originated in a hedge in the Forest of Armaille, and named from its having been found in July, 1815, about the time the French royal family returned for the second time from exile. Size, large; form, between round and oblong, tapering very much towards the stalk; surface, very uneven; colour, dull yellow, spotted with broad irregular russety patches; eye, small for so large a fruit; stalk, short and strong; flavour, very good; duration, October and November; habit, requiring a wall, on which it will bear early, particularly if wrought on a quince stock.

34. Early Bergamot.—Introduced by the Hort. Soc., through the late Mons. Thouin, of Paris, in 1820. Size, medium; form, roundish, flattened at the eye; colour, greenish brown, turning yellowish when ripe; flavour, very good; duration, the last week of August, and two first of September; habit, hardy, a great bearer as a standard, its chief merit being its earliness and productiveness.

35. Easter Beurre. [*Syn.*, Bergamotte de la Pentecote, Beurre d'Hiver de Bruxelles, Dayenne d'Hiver.]—Introduced from the Continent within these five years. Size, large; form, oblong; colour, green, with many russety spots, turning yellowish brown when ripe; eye, small; stalk, short and stout; flavour, excellent; duration, from November till May, or later; habit, although it ripens its fruit well in the neighbourhood of London, it is of such great merit, being the best of all winter pears, that a situation should be assigned

for it upon a south wall, where it will bear abundantly, particularly if grafted upon a quince stock.

36. Elton.—Originated in an orchard, in the parish of Elton, in Hertfordshire, but how or when is unknown. The original tree was supposed by Mr. Knight, in 1812, to have been 170 years old. Size, medium; form, oval; colour, greenish russety grey, slightly tinged with orange on the side next the sun; eye, very small; stalk, stout and straight; flavour, excellent; duration, September and part of October; habit, perfectly hardy, and succeeds better as a standard than when trained against a wall.

37. Flemish Bon-chretien. — Originated in Flanders about 1820. Size, large; form, oblong; colour, greenish yellow, with many grey russety specks, particularly on the side next the sun; eye, open; stalk, short and straight; flavour, rich and perfumed; duration, from November till January; habit, sufficiently hardy to ripen as an open standard in the neighbourhood of London, but deserving of a wall in most situations.

38. Forelle. [*Syn.*, Poire Truite, or Trout Pear, the beautiful red spots on its skin resembling those of some kinds of fish of the trout sorts.]—Size, below medium; form, longish oval, but is apt to vary in this respect; colour, green on one side, red on the other, the former colour varying to yellow or lemon, and the latter to blood colour, beautifully spotted next to the sun; eye, shallow; stalk, short, slender, and straight; flavour, rich and agreeable; duration, from November till January; habit, hardy enough for a standard, its native country being supposed to be northern Saxony.

39. Gansel's Bergamot. [*Syn.*, Brocas Bergamot, Bonne rouge, Joe's Bergamot.]—Originated about 1768, from a seed of the Autumn Bergamot, at Donneland Hill, in Essex, the seat of General Gansel. Size, large; form, oval roundish; colour, dull brown all over, rather deeper brown next the sun; eye, small; stalk, short and fleshy; flavour, excellent; duration, November and beginning of December; habit, although of English origin, it is much too tender to succeed as a standard; its merits, however, claim for it a place on the wall of every good garden.

40. Gendeseim.—Originated in Flanders within these four years. Size, rather above medium; form, pyramidal; colour, yellowish green, with some patches of grey russet; eye, small; stalk, short and crooked; flavour, rich and musky; habit, sufficiently hardy to ripen as a standard in the neighbourhood of London.

41. Gilogil. [*Syn.*, Dagobert, Gros Gobet, Gile-o-gile.] — Size, large; form, ovalish, flattened at each end; colour, russety on the shaded side, brownish red on the side next the sun; eye, large; stalk, short; flavour, rich and pleasant; duration, from December till April, or later; habit, sufficiently hardy to ripen as a standard in favourable situations; but so valuable a winter pear deserves a wall in most places.

42. Glout Morceau, which appears to be the proper orthography of the name, although it is often written Gloux Morceaux. — Introduced, in 1820, from Flanders. Size, considerably above medium, when grown in Belgium, and certainly much larger than we have seen it in this country; form, somewhat roundish oval; colour, pale olive green, becoming yellowish when fully ripe, and covered with many russety specks; eye, small; stalk, short; flavour, excellent; duration, from November till March; habit, although it ripens in

many gardens round London, and probably elsewhere, as an open standard, so very excellent a pear should find a place upon a wall in every good garden. We have tasted it in the fruit-room of the Hort. Soc., and also frequently in the Netherlands, where it is very generally grown, and consider it one of the best of all the Flemish pears; but it is certainly very superior, both in size and flavour, on the Continent, to what we have observed it in this country.

43. Green Sylvange. [*Syn.*, Bergamotte Sylvange, Sylvange vert.]—Originated at a village of that name, between Thionville and Metz. Size, medium; form, thick in the middle, rounded towards the stalk, and generally irregular in its outline; colour, green on the shaded side, darker and spotted with black blotches next the sun; eye, small; stalk, short and slender; flavour, very good; duration, October till January; habit, rather tender, requiring the protection of a wall.

44. Grey Doyenne. [*Syn.*, Doyenne gris, Red, or Dorenne rouge, Doyenne d'Automne.]—Size, rather above medium; form, roundish and turbinate; colour, bright russet, reddish towards the sun; eye, small; stalk, short and strong; flavour, excellent; duration, October and November; habit, hardy, and we have no doubt would succeed well as a standard, although the trees under our observation have been grown against a west wall. A most abundant bearer.

45. Hacon's Incomparable.—Originated by Mr. Hacon, of Downham Market. Size, medium; form, somewhat conical, but a little irregular in its outline; colour, pale yellowish-white, considerably intermixed with green; eye, small; stalk, short and stout; duration, in November and December; flavour, very rich and perfumed; habit, pendulous in growth; ripens well as a standard, and is an abundant bearer.

46. Henry the Fourth. [*Syn.*, Henri Quatre.]—Introduced from France. Size, under medium; form, conical; colour, pale yellow, and green on the shaded side; brownish orange, interspersed with many russety specks, on the sunny side; eye, small; stalk, short and crooked; flavour, sweet and musky; duration, end of September, and beginning of October; habit, hardy, ripening on standards.

47. Incommunicable. [*Syn.*, L'Incommunicable.]—Introduced from Flanders; and, although an excellent fruit, might have had a more intelligible name. Size, above medium; form, conical, compressed towards the stalk; colour, light green, interspersed with numerous russety specks; eye, small; stalk, short, stout, and crooked; flavour, rich, and slightly perfumed; duration, the two last weeks in October; habit, hardy; bears well as a standard, and is in general very prolific.

48. Jargonelle. [*Syn.*, St. Lambert, Gros Cuisse Madame.]—Introduced many years ago from France. Size, large; form, oblong, or rather pyramidal; colour, greenish yellow where shaded, tinged with brownish red next the sun; eye, open; stalk, long and obliquely seated; flavour, agreeable; habit of the tree different from almost all other pears, inasmuch as the young branches hang dangling downwards, are of unusual strength, and the leaves are covered with a thick coat of downy matter, particularly when young. We find it enumerated as a standard in the collection at Sayes Court, in 1687. In the north it is trained against walls, and in all cases is an abundant bearer.

49. Keiser. — Introduced from the Continent. Size, medium; form, conical; colour, palish green, turning yellowish when ripe, interspersed with many russety specks; flavour, agreeable; eye, small; stalk, medium length, strong, and hard; duration, October and November; habit, hardy, and abundant bearer as a standard.

50. Lent Saint Germain. [*Syn.*, Easter St. Germain.]—Size, large; form, oblong, thickest in the middle, tapering towards each end; colour, pale green, on which are scattered many grey specks; eye, narrow; stalk, short; flavour, although not high, is yet agreeable; duration, in March, April, and May; habit, hardy, but requiring a wall to ripen it perfectly in most places; its greatest merit consists in its coming into use at a season when few other pears are to be had.

51. Louis-Bonne. — Introduced at an early period from France. Size, above medium; form, oblong pyramidal; colour, pale green, turning yellow when ripe; eye, small; stalk, short and straight; duration, from November till January; habit, hardy, and succeeds as a standard in most situations. The Louis-Bonne of Jersey is a very superior variety; fine specimens of it are annually introduced from that island.

52. Marie Louise.—Originated with the Abbé Duquesne, and introduced by the Hort. Soc., through Dr. Van Mons, of Brussels, in 1816. Size, considerably above medium; form, very much resembling the St. Germain; colour, greenish before it is ripe, but then changing to a fine yellow, with a slight covering of russet, particularly on the side next to the sun; eye, open; stalk, of medium length; duration, in October; habit, hardy; an early bearer, both as a standard, espalier, or wall tree, and, although possessing no extraordinary flavour, is notwithstanding one of our most valuable autumnal pears.

53. Merveille d'Hiver. [*Syn.*, Petit Oin.]—Originated evidently on the Continent. Size, medium; form, conical; colour, green, becoming yellow when ripe; eye, large: stalk, short; flavour, sugary and musky; duration, in November and December; habit, hardy; a good bearer, and deserving to be more generally cultivated than it is at present.

54. Napoleon.—Originated with Dr. Van Mons, in Belgium, and introduced here in 1816. Size, considerably above medium; form, conical, having a very broad base; colour, green, changing to a paler colour as it gets riper; eye, small; stalk, short, thick, and not crooked; duration, in November; habit, perhaps too tender for a standard tree, but produces abundant crops on east or west walls. In our estimation this fruit has been, like many of the Flemish pears, extolled beyond its merits.

55. Passe-Colmar. [*Syn.*, Chapman's, Beurre Colmar gris.]—Originated with M. Hardenpont, in Belgium. Size, medium; form, conical, rather flattened at the crown; colour, green, turning yellowish, interspersed with russet; eye, open; stalk, about medium length; duration, in December and January; habit, hardy, ripening well as an open standard; increases in size when grown against a wall, which it will require in the north to bring it to full perfection. One of the most valuable pears we have. The specific name Passe is not to be here understood as if this kind of Pear was superior in quality to the Colmar, but that it is superior to it only in hardiness and productiveness. The synonyme Chapman's Pear originated in a market gardener of that name

having propagated great numbers of young trees of the Passe Colmar, and sold them as a new pear, to which he gave his own name.

56. Poire de Louvaine.—Originated at Louvaine, in Belgium. Size, medium; form, conical; colour, dull green and yellow; eye, small; stalk, short; duration, in October; flavour, rich and musky; habit, hardy enough to ripen as a standard near London, but deserves a place on an east or west wall. Less cultivated than its merits deserve.

57. Poire Neill.—Originated in Flanders, and named in compliment to Dr. Neill, of Edinburgh, a gentleman to whom Horticulture, and indeed Natural History in general, is much indebted. Size, above medium; form, conical, somewhat compressed on its sides; colour, pale yellow and green, mottled with grey russet; eye, open; stalk, shortish; duration, in October; habit, hardy, and productive even as a standard; a good and handsome fruit.

58. Princess of Orange.—Originated with the Comte de Colmar, in the Netherlands, about 1802. Size, rather above medium; form, roundish; colour, reddish orange russet; eye, large; stalk, short; duration, in October; habit, a productive bearer, and deserves a place on an east or west wall.

59. Royal d'Hiver.—Size, above medium; form, conical, somewhat irregular; colour, yellow on the shaded sides, reddish next the sun; eye, small; stalk, medium length; duration, from December till March; habit, hardy, and a productive bearer. This sort does not succeed well on the quince stock, but admirably on the pear.

60. Saint Germain. [*Syn.*, Inconnu de la Faire.]—Originated about 150 years ago, in a wood on the banks of the river Faire, in the commune of St. Germain, in the province of the Isle of France. Size, large, when too many are not left on the tree; form, conical; colour, green, becoming yellowish brown when ripe; eye, small; stalk, short; duration, from November till January; habit, young wood slender, an early and abundant bearer; requires a good soil, and warm well-exposed wall. In cold situations and damp soils the fruit seldom attains perfection. "No tree thrives better in a light shallow loam, on a dry bottom; and no pear is of less value, if grown in deep, rich, heavy soil. The fruit becomes insipid, gritty, and not worth presenting at table. This variety is easily known by its green shoots, narrow leaves, which are somewhat reflexed at the edges, and by its small compact bunches of flowers. The tree is apt to produce distorted fruit, which should always be cut off, along with all supernumeraries that may set."—*Rogers.*

61. Saint-Pere. [*Syn.*, Saint-Pair.]—Originated in France. Size, under medium; form, conical; colour, yellow; eye, small; stalk, of moderate length; duration, from February till May; habit, hardy, and an abundant bearer; better adapted for the kitchen than the dessert.

62. Seekle. [*Syn.*, Sycle, New York Red Cheek.]—Introduced by the late Dr. Hosack from America, in 1819. Size, small; form, conical; colour, brownish green on one side, bright red on the other; eye, small; stalk, short; duration, in October; habit, although a small fruit, it is one of the very best American pears; is very hardy, bearing abundant crops on standards, its only defect being that it keeps only a few days after it is ripe.

63. Swan's Egg.—Originated, it is conjectured, in Britain, but when or where is not now known. It is one of our oldest sorts, and is enumerated in the

MS. collection at Sayes Court, in 1687. Size, small; form, ovalish; colour, greenish yellow, dullish brown, with many russety specks on the side next the sun; eye, small; stalk, of moderate length, and slender; duration, in September and October; habit of the tree, unlike most others, being upright and spire-like in its growth, extremely hardy, and producing abundant crops of fine ripened fruit upon standards. Stocks reared from seeds of this pear are excellent for grafting on.

64. Tillington.—Originated in the village of Tillington, in Hertfordshire, from a seed of the autumn Bergamot, the blossom of which had been fecundated with the Jargonelle. Size, full medium; form, conical; colour, green where shaded, dirty red and a good deal russeted on the sunny side; eye, small; stalk, short and fleshy; duration, in November and December; habit, extremely hardy, and well worth the attention of the orchardist.

65. Virgouleuse. [*Syn.*, Poire-glace, Chambrette.]—Originated near a village called Virgoule, near St. Leonard, in Limousin, from whence it was sent to Paris by the Marquis Chambrette, but at what period is not stated. It must have been at an early period of the 17th century, as we find it stated to be an excellent winter pear in the MS. catalogue of fruits in the Sayes Court garden, in 1687. Size, above medium; form, conical; colour, grass green, becoming yellow, and sprinkled with many red dots, when ripe; eye, small; stalk, short; duration, from November till January; habit, too tender for a standard in most situations, requiring a good soil and warm exposure.

66. White Beurre, White Butter Pear. [*Syn.*, Beurre blanc, Doyenne blanc, La Doyenne, or the Dean's Pear, White Doyenne, Valencia, Kaiserberne, Carlisle, Citron de Septembre, Poire Monsieur, Poire de Neige, Poire de Limon, Poire de Seigneur, Poire à courte queue. It is of all these names best known in the English gardens by the one to which we have given the precedence.] Originated many years ago in France. Size, considerably above medium; form, roundish oblong; colour, pale yellow, speckled with crimson russet; eye, small; stalk, short and thick; duration, end of September, October, and beginning of November; habit, hardy, and when worked on the quince stock makes an excellent dwarf standard.

67. Williams's Bonchretien.—Originated previous to 1770 from seed in the garden of a schoolmaster of the name of Wheeler, in Berkshire, and whose name it ought to have borne, instead of that of Williams, who was a respectable nurseryman at Turnham Green, and who propagated it extensively, and gave it his name. Size, large; form, conical, but very irregular on the surface; colour, pale green, turning yellowish, tinged with red, when ripe; eye, prominent; stalk, short and thick; duration, September; habit, hardy; an abundant bearer, either as a standard, or trained against a wall.

68. Winter Bonchretien. [*Syn.*, Poire d'Angoisse, Bonchretien d'Hiver.]—Size, very large; form, conical, but rather irregular; colour, yellowish, tinged with brown on the side next the sun; eye, smallish; stalk, of medium length, slightly bent; duration, from January till March; habit, rather tender for a standard, but its good qualities claim for it a place against a south wall.

69. Winter Nelis. [*Syn.*, Nelis d'Hiver, Le Bonne Malinoise, Bonne de Malines.]—Originated with M. Nelis, of Malines, a town between Antwerp and Brussels. Size, above medium; form, conical; colour, greyish green, with many grey dots, somewhat brownish russet on the side exposed to the sun; eye, large;

stalk, of moderate length; duration, in December and January; habit, tree hardy, and ripening its fruit well as a standard, but deserves an east or west wall.

70. Yat.—Originated in Holland, and introduced into Britain about seventy years ago. Size, small; form, conical; colour, russety brown, interspersed with many greyish spots; eye, small; stalk, short and slender; duration, September; habit, hardy, producing abundant crops of fruit on standards; the shoots are pendulous, like the Jargonelle, but more numerous and slender.

PROPAGATION OF THE PEAR.

The Pear, like the apple, is propagated by seeds, layers, cuttings, budding, and grafting.

Seeds.—The Pear is propagated by seeds, either with a view to obtain new varieties, or for the purpose of stocks on which to bud or graft known or approved kinds. The late Thomas Andrew Knight, Esq., whose death is a loss alike to horticulturists and to those who had the honour of his acquaintance, has done much in the way of obtaining new sorts by this process, and the late Dr. Van Mons, of Brussels, has carried it still further, and has at one time or other originated many thousands, some of which are of first-rate qualities. This intelligent individual, in conjunction with M. Duquesne, of Mons, possesses about eight hundred approved sorts, which they obtained from seeds within the space of fifteen or sixteen years. Pears are more uncertain from seeds than apples, by far the greater number being unfit for any other purpose than to be headed down and grafted with known sorts. The following criterion was given by Van Mons to the deputation sent by the Caledonian Horticultural Society to inspect the gardens of the Netherlands, viz., when a seedling indicated a blunt shape, thickness and woolliness in the leaf, or a fulness of the buds and softness of the bark, it was considered as likely to produce good fruit; and that this might be the sooner ascertained, grafts of such were put upon established trees. Seedling pears in Belgium often produce fruit in four or five years, while in Britain seven, ten, or more years often elapse. The first year's fruit is inferior to that produced the third and fourth year, and if the pulp be white, heavy, and the juice of rather a pungent acidity, it may be expected to improve afterwards. New varieties of Pears are more likely to be obtained from the seeds of new than of long-cultivated sorts.

This doctrine does not exactly accord with the experience of the late T. A. Knight, who observes, (*Treatise on the Apple and Pear*, p. 140,) "An estimate may be formed in the apple of the merit of the fruit by the leaf and growth of the seedling tree, but in the pear these scarcely afford the slightest indication of the future produce. The leaves of those plants which will afterwards afford large, rich fruit for the dessert are often small and thin, and the stems will be covered with thorns; whilst others, whose leaves and growth show every mark of a high state of cultivation, will sometimes produce fruits which are small and worthless. The time which seedling trees will require to attain sufficient maturity to produce fruit, appears to vary much in different varieties. I have one plant which produced fruit at sixteen years old, and another which, from the concurrent testimony of many old people, who remember its first blossoms, appears to have remained unproductive through the first seventy years of its existence! It has since borne tolerably well; but its fruit is always without seeds, or internal cavity; and it appears to set with difficulty, much the greater part of the blossoms being constantly unproductive." He gives this latter part of the quotation as an extreme case, but at the same time it shows how little dependence we can place on the period of maturity or fruitfulness in the Pear when originated from seeds.

Whoever intends to obtain new varieties from seed must pay strict attention to artificial impregnation, which has been fully explained in the article Apple, *which see.*

The seeds of the cultivated varieties of pears are sown in considerable quantities annually for obtaining stocks for grafting or budding on. Some prefer the seeds of the wild pear for this purpose, which they say are more hardy and durable; but these are now rather difficult to procure, as the wild pear is less abundant in our woods than formerly. Others, and perhaps with equal good reason, prefer the seeds of our cultivated sorts, which are procured in great abundance from the perry manufacturers. "The seeds of the most erect-growing trees," says Rogers, "are usually chosen for raising stocks from: such as the Summer Bergamot, the Swan's Egg, and the Windsor. These produce seedling stocks, which soon run up standard high, and fit to receive the graft: whereas, were seeds of dwarfish-growing kinds employed, the seedlings are apt to partake of the habit of the parent tree, and be longer in gaining the desired form and height. Here it may not be amiss to pay a deserved compliment to both the French and Flemish nurserymen, for the pains they take in keeping distinct and classifiying their stocks. Tall and strong growers, middling growers, and dwarfish growers, are each kept separate, and grafts adapted to them according to the purpose of the planter. This practical expedient is perhaps less regarded in this country than it ought to be. It is true we use the quince stock for checking the luxuriant growth of some of our pears; but it is not improbable that stocks raised from the seeds of the Petit Muscat would answer quite as well for the purpose."

The Pear is most successfully grafted upon its own species, but it will, nevertheless, also succeed on quince, medlar, the white beam, the common service, and the hawthorn. We may also here observe, that there is much less difference between free pear stocks, or those raised from cultivated kinds, and wild pear stocks, than between free apple stocks and those obtained from the seeds of the uncultivated crab.

Seedling pears are apt to go off during the early part of the first summer; they must be kept clear of weeds, the ground between the rows repeatedly stirred with the hoe, and water supplied to them during dry weather.

Layers.—The Pear is capable of being propagated by layers, both for continuing the sorts already known, and for a supply for stocks to graft upon. Neither of these modes is, however, productive of much advantage, as they produce plants very inferior to those obtained by the more general modes of grafting and budding.

Cuttings.—This method of propagation is very seldom had recourse to in the case of the Pear; the operation is, however, practicable, but not so successful as in the case of apples.

Budding.—Young pear stocks which have been grafted in spring, and may have failed, may be budded about the latter end of July. For this purpose cut off the head of the stock an inch or two below where it was grafted, so as to get rid of the part where the operation had been performed; this should be done as soon as the failure of the graft can be determined, or the embryo shoots of the stock will be destroyed, as they begin to push when the ascent of the sap is in full force. The shoots produced from the stock should be carefully preserved, the weakest rubbed off, and one or more, according to circumstances, left; this will be in a fit state for receiving the buds about the end of July. Large trees which have been cut down and grafted, and which have failed to take, should be treated in a similar manner,—those against walls or espaliers should be so trained as to lay the foundation of the form of the future tree. For the manner of performing the operation of budding, see the article Peach, Nectarine, &c. The advantage of budding under these circumstances is the gain of a season's growth. Sometimes budding is performed on the Pear when grafts cannot be obtained in due time, or when it is desirable to propagate rapidly any new or rare sort, as every bud under favourable circumstances will form a separate tree, while a graft requires one, two, or more buds to produce a like result. Many, indeed, prefer budding to grafting in propagating the Pear, and amongst the number we may instance Mr. George Lindley, whose experience in these matters was very considerable. He says, " It is by far the most preferable way to bud them instead of grafting them; by this method, many of the most vigorous will attain a height of six or seven feet the first year of their growth, and make fine standards the second, whilst those sorts possessing less vigour will come in the year following."

GRAFTING.—Grafting is the most usual mode of propagating the Pear, and in the mode of operation in no respect differs from what has already been directed for the apple.

STOCKS.—The stocks usually adopted for the Pear are the free stock or cultivated pear, the wild crab pear, the quince, the white thorn, the white beam, the medlar, service, or apple; but the free stock, crab pear stock, and quince are the most general in use; the first, when the object is to produce standards to be planted in a good dry soil, in which they grow luxuriantly; the second, to produce standards for ordinary or indifferent soils, in which they continue to flourish for ages if not injured by injudicious after-management; and the third, to produce small or dwarf trees of the choicest sorts for gardens, espaliers, and walls.

The quince is recommended by Miller as a proper stock for a wet soil, in which it will succeed better than free or crab pear stocks, and also that it very much improves the quality of the melting sorts of pears, while the breaking kinds are rendered gritty and stony. There are some sorts of pears which do not take on the quince stock either by budding or grafting; but this can be remedied by grafting those sorts on the quince that do take, and the season afterwards grafting on them the kinds that do not take at once on the quince. An opinion was once entertained that the process of double grafting, that is, grafting every tree for two successive seasons, even if with the same kind of fruit, had a tendency to improve its quality, from the changes the sap was supposed to undergo in its passage through a stem belonging to different kinds of fruit. This opinion is not yet entirely obsolete; but, as the leaves are the chief laboratory in which Nature prepares the juices of plants, so they also fit those of the same stock to nourish fruits of different forms, flavours, and colours.

If double grafting has no effect in improving the quality of fruit, (which we think it has not,) it may be perhaps advantageously employed in bringing pears earlier into bearing, and would be a much more natural or at least a much less mutilating process, than either ringing or piercing, so much recommended by authors of all ages. The obstruction the sap would meet with in passing through the two places of union would be tantamount to the limited supply of sap permitted to ascend when a portion of the bark is removed.

Rogers assigns as a reason for the quince stock becoming so popular in this country, the "bad success attending the ordinary method of planting pears worked on seedling stocks in too deep and rich borders, which causes such exuberant growth, and consequent barrenness, that the trees were only useless encumberers of the ground. Now," he adds, "had the borders been properly prepared, by having a hard, dry bottom, with a surface layer of light, fresh loam, about fifteen inches deep only, the same trees would have taken a kindly growth, and very soon would have been fruitful."

The opinion of Mr. Bernard Saunders, nurseryman of Jersey, is much to the same effect: he remarks, in the Gardener's Magazine, "Of the different sorts of stocks, I have found the Portugal quince answer remarkably well for most of our free-growing kinds of pears; in particular, if the soil be deep and good, and the bottom not too dry, they shoot freely, and in a short time after planting produce abundance of superior-flavoured fruit. Even weaker-growing sorts are valuable on these stocks: as, where the garden is limited, and variety required, a double or even triple quantity may be planted, a great object to some cultivators." Mr. S. concludes by observing, that free stocks are very preferable where the soil is high and dry.

THE FREE PEAR STOCK, AND WILDING PEAR STOCK.—These certainly produce the most durable trees, and if the necessary precaution of forming the borders of a proper soil, and more particularly of a limited depth only, be taken, fruit will be produced at nearly as early an age as when the quince stock is used, and the fruit will not only be much larger, but altogether of superior quality.

THORN STOCKS.—Pears wrought on the thorn come early into bearing, and continue long to bear abundant crops. This stock is found to succeed on strong clay soils, where neither the wilding nor quince would flourish. It is, however, supposed to have the effect of rendering the fruit small and hard, owing no doubt to the more scanty supply of food supplied from the roots. Trees wrought on this stock, whether budded or grafted, should be operated upon near the ground, or even on the roots: as the stock is of much slower growth than the graft, the former would not increase in diameter so rapidly as the latter, and hence the trees would have a deformed appearance, their stems becoming in course of time much less than the principal branches of the head.

Soil.—In deep alluvial soils the Pear is found to succeed well, as it also does in loams of the best qualities, where the bottom is dry. It is seldom, however, that such soils exist in situations convenient for an orchard; and the formation of an artificial soil of that description for the purpose would be both inconvenient and expensive. We have elsewhere remarked, that the Pear is a much hardier tree than the apple, and that it will succeed in soils in which the former would not; indeed, there is scarcely any which it will not live in. In light loamy or sandy soils the Pear, upon its own stock, comes earliest into bearing, but of course is of shorter duration: in damp strong clay soils it becomes diseased, the young wood of many kinds not ripening, and the tree ultimately dies altogether: in such soils the use of quince stocks and planting on the surface, or nearly so, are the only remedies. Deep soils are not necessary for the Pear; from eighteen inches to two feet and a half are quite sufficient, and the roots of this tree should be prevented from extending to a greater depth, by forming artificial floors, or placing broad flag-stones under them; by which obstruction they will take a horizontal direction, and be kept out of a bad subsoil. Deep and rich borders have been recommended for the Pear, and such have been formed at very great expense; the consequence has been, the production of immoderately luxuriant trees, which have continued for fifteen or twenty years producing abundant crops of foliage and young wood, without bearing a single fruit; and should they, even at that advanced age, it is ten to one that the produce is confined to a few of the extreme points of the shoots only. To correct this habit of luxuriance, brought on by an over-rich and deep soil, the cultivator has had recourse to pruning and training in their various modifications; and when these have failed, he has had recourse to mutilations of the most violent description, of which ringing, boring, wiring, &c., are amongst the number.

Attention to the selection of proper stocks in the first instance, planting in a light shallow soil, and preventing an unnecessary growth by disbudding early in spring, and as little knife pruning as possible, will produce trees and fruit to the utmost of the cultivator's wishes, and will render, as Rogers very justly remarks, "unnecessary all those fanciful and distorted schemes of training, ringing, disbarking, &c., so much recommended by writers, and relied on by practitioners. A tree may certainly, with proper treatment, be kept in moderate health and fruitfulness, without doing violence to either its natural habit or constitution."

Planting.—Many of the observations under this head, in the article Apple (*which see*), are applicable to the Pear also. We may, however, add, that Forsyth and others have recommended planting the Pear at a much greater age than what is usual in the case of the apple. Forsyth says,—"I would advise those who intend to plant pear trees, instead of choosing young ones, to look out for the oldest that they can find in the nursery, and with strong stems; to have them carefully taken up, with as much of the roots as possible, and carefully planted, after cutting in the roots a little, spreading them as horizontally as you can. Then fill up all round the roots with light dry mould, forcing it in, about those that lie hollow, with a sharp-pointed stick; filling the hole up to the top, without treading the mould, till you have first filled it with as much water as it will contain, leaving it a day or two until the ground has absorbed the water; then throw on some fresh dry mould, and tread it as hard as you can; fill the hole up again with mould to within an inch of the top, and give it a second watering, leaving the mould about three inches higher than the border, to settle of itself, and to receive the rain that falls, for at least a month. When the mould has become quite dry, you may tread it a second time; then make a large basin round the tree, and give it another watering; then mulch the top over with some rotten leaves or dung, observing to water the trees once a week in dry weather, and sprinkle the tops frequently with a pot, or hand-engine, to keep the wood from shrivelling till the trees have taken fresh root."

PRUNING.—We apprehend that cultivators have laid more stress on the various modes of pruning the pear tree, with a view to increase its productiveness, than to the kinds of stocks it is wrought upon, or the soils it is planted in. Pruning, and, we may add, training also, are both to a very considerable extent to be considered only as remedies to correct the evil of having planted in too deep or too highly manured a soil.

PRUNING STANDARD PEARS.—The late Mr. Knight observes, in *Treatise*, p. 148, "Pruning is not often wanted in the culture of the pear tree [that is, when grown as a standard], which is rarely much encumbered with superfluous branches; but in some kinds, whose form of growth resembles the apple-tree, it will sometimes be found beneficial." All open standards most certainly require pruning, were it for no other purpose than to keep them sufficiently thin of wood, much of which is often superfluous, and prevents the free admission of sun and air to the centre of the tree; besides, the existence of every superfluous branch tends to rob the tree of that nourishment which would otherwise go to the formation of the fruit. Trees of pendent habits, of which there are many amongst pears, require this attention in a particular degree, because they are constantly sending up strong young shoots from their upper surface, which creates confusion, exhausts the tree, and prevents the fruit from attaining either its proper size or colour. All standard fruit trees should be so pruned, that the points of the external shoots or branches should be every where thin and pervious to light; the light should penetrate deeply into the tree on every side, but not any where through it. If this be particularly attended to, the inside, as well as the outside, will be productive of fruit; and in unfavourable seasons, the interior of the tree will be rather protected than injured by the exterior. "A tree thus pruned," says the late Mr. Knight, "will not only produce much more fruit, but will also be able to support a much heavier load of it, without danger of being broken; for any given weight will depress the branch, not simply in proportion to its quantity, but in the compound proportion of its quantity and of its horizontal distance from the point of suspension, by a mode of action similar to that of the weight on the beam of the steelyard; and hence, ten pounds' weight at the extremity of a branch fifteen feet long, will depress it more than one hundred and fifty pounds would, if suspended within one foot's distance of the trunk. Every tree will, therefore, support a larger weight of fruit, without danger of being broken, in proportion as the parts of such weight are made to approach nearer to the centre." The directions given for regulating the branches of standard apples are to be attended to in the case of the Pear also.

Quenouille Pruning and Training.—This is a mode of training the Pear which has long been practised on the Continent, and introduced into this country a few years ago: it consists in training the tree to one perpendicular stem, and trees from buds are usually preferred. This stem is allowed to attain the height of seven or eight feet in this country; but we have observed them on the Continent twenty and twenty-five feet in height. The branches which issue from this upright stem are regulated to pretty equal distances from the bottom to the top, and are generally about eighteen inches or two feet in length, and brought into a pendent direction by bending the young shoot downwards, as it grows, by tying it with a string to the stem till it has finished its growth in autumn. The intention of giving the branches this pendulous form is to check the rapidity of the sap, and thereby induce it to throw out fruit buds. As more of these side branches than would be required are annually formed, they are thinned by disbudding to about nine or twelve inches distance, according to the habit of the tree, whether it be a luxuriant grower, or one with large leaves, or the reverse. The rationale of the practice is thus laid down by Lindley:—"The effect of turning the branches of a tree from their natural position to a pendulous or horizontal one is, to impede both the ascent and descent of the fluids in a gradual but certain manner. The tissue of which branches are composed is certainly permeable to fluids in every direction; and there can be no doubt that the vital action of the vessels of a plant is performed both in the natural and in an inverted position. So long as that erect direction of the branches which is natural to them is exactly maintained, the flow of their fluids, being subject to no interruption, will take place in the fleetest possible manner; but the moment this natural direction is deviated from, the vessels become more or less compressed, their action is impeded, and finally, if the inversion is perfect, it becomes so slow that an accumulation of the proper juices necessarily takes place through every part of the system."

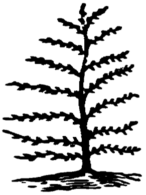
Notwithstanding all that has been said in favour of this plan, and the reasonableness of the theory, it must be admitted that only some kinds of fruit succeed by it, and these certainly produce abundance of fruit, while others are found to be as tardy, if not more so, in coming into a bearing state as if they were trained in the common open standard manner. Sorts of a weak and twiggy habit are found to succeed best, and these we find also come into bearing soonest by any other method of training that they may be subjected to.

PRUNING AND TRAINING DWARF STANDARDS.—The Pear is often successfully trained in this manner: we should, however, prefer trees for it being wrought on the quince stock, or, if on free stocks, their roots circumscribed within the limits of three or four feet from their stem, by means of brick or stone walls, and of a depth of two feet, or two feet and a half. This method is often practised in the case of figs, but we have never seen it applied to the Pear: we think, however, that such a practice would have the effect of checking luxuriance of growth, bring on an early disposition to produce fruit, and would in many respects be better for the tree than the more barbarous methods of ringing, boring, bending, &c., which all tend to bring on a premature decay; whereas, by this mode additional nourishment could be supplied, as the state of the tree might appear to require.

PRUNING AND TRAINING AS AN ESPALIER.—The Pear is often trained in this manner, and the horizontal mode is usually adopted, which in no respect differs from the same mode of training against walls (*which see*).

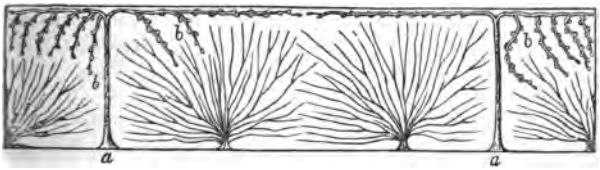
PRUNING AND TRAINING AGAINST WALLS.—The Pear is trained in almost every variety of way against walls, and of these the following are the principal, viz., Horizontal, Fan, and Vertical; but of these there are many sub-varieties, of which the following are amongst the number, viz. Irregular Fan, Wavy Fan, [illegible] Fan, [illegible] Fan, Drooping Fan, [illegible] Fan, &c.; Horizontal, with a single stem; Horizontal, with double stem; Vertical, with upright shoots; Vertical, with screw or wavy shoots, &c. &c.

Horizontal Training is best to use when the walls are low, and almost always in espaliers, not only on account of the want of space to train the branches of the Pear to a sufficient extent through which the sap may move, while it receives the necessary elaboration for the formation of the blossom buds, but also because, next to the pendulous form, it is the most powerful in checking the too rapid circulation of the fluids; for, as Lindley justly remarks, "Physiologists know that whatever tends to cause a



rapid diffusion of the sap and secretions of any plant," (which vertical or perpendicular training would do to the fullest extent), "causes also the formation of leaf-buds instead of flower-buds; and that whatever, on the contrary, tends to cause an accumulation of sap and secretions, has the effect of producing flower-buds in abundance. This circumstance, which at first sight seems to be difficult to account for physiologically, is no doubt to be explained by the difference between leaf-buds and flower-buds themselves. In a leaf-bud all the appendages or leaves are in a high state of developement, and the central part or axis, around which they are arranged, has a tendency to extend itself in the form of a branch as soon as the necessary stimulus has been communicated to the system by the light and warmth of spring. In a flower-bud the appendages or leaves are in that imperfectly formed, contracted state, which we name calyx, corolla, stamen, and pistilla; and the central part around which they are arranged has itself no tendency to elongate under the influence of the usual stimulants. It is, therefore, easily to be understood why, so long as the motions in the fluids and secretions of a tree go on rapidly, with vigour, and without interruption, only rudiments of branches, or leaf-buds, should be formed; and why, on the other hand, when the former become languid, and the parts are formed slowly, bodies of a contracted nature, with no disposition to extension, or flower-buds, should appear." This is the true rationale of horizontal training; and, therefore, as the Pear is of all our cultivated fruit the longest in coming into a bearing state, it follows that horizontal or pendulous training, or some of the varieties of either, is the most proper to produce that effect.

A very novel mode of training, which combines both the horizontal and pendulous, has been recommended by Mr. Mearns, in the Horticultural Register for May, 1832. For this purpose he plants riders at equal distances, the stems of which he allows to reach nearly to the top of the wall, and from thence a shoot is trained horizontally to the right hand, and another to the left, so that the tree at this stage has the appearance of the letter T. These horizontal branches are trained along without being stopped, till they meet those of the trees next adjoining to them: from these horizontal shoots others are produced, which are trained perpendicularly downwards till they reach nearly to the ground. But let Mr. Mearns speak for himself:—"It suggested itself to me, about five years ago, to furnish all my walls with bearing wood from the top, instead of from the bottom of the wall, as is the usual practice; for none of the young shoots, or other bearing wood, having an altitudinal inclination, the wall could be furnished more regularly with fructiferous wood than upon the old or horizontal forms of training. If too much luxuriance be contemplated, it is then readily checked, by permitting the superfluous sap to be thrown off at top, from the upper side of the horizontal limbs that are trained under the coping (as shown in accompanying Cut), which they will always be disposed to do, especially when the tree has once occupied all the space allotted for it to extend on: and such shoots can be cut out in the months of July or August, or not till the autumn, if it may be considered judicious to retain them till that time, for carrying off the extra juices, so as to check any over-luxuriance that may be considered probable to endanger a premature bursting of the fruit-buds."



"Such a method of training, as shown by the foregoing figure, is clearly much more fructiferous than the old fan or horizontal forms, for wall-trees of the spur-bearing kinds. It is undoubtedly far more scientific, and at the same time much more economical, than the method we too frequently see adopted of covering one side of a wall to furnish the other, by bringing the branches over the top of the wall, and then hanging them downwards on the opposite side: as by such a method both sides are sacrificed to furnish a plentiful crop only upon one, for, as soon as the pendent shoots brought over begin to produce fruit, the originals upon the opposite side become nearly barren." Pears might be planted on the opposite side of the wall, and trained to a single stem, as practised by Mearns above, and brought over the wall in a pendent form. This plan, however, has no advantage over that explained above, except that it might be employed in cases where a proper border could not be formed for the roots on the side intended to be covered. A circumstance of this nature first induced Sir Joseph Banks to train the shoots of some pears over a wall having a southern exposure, but where trees could not be planted, both on account of a ditch on the other side, and also from its being the outer boundary of the Spring Grove garden.

Fan Training is preferred by most gardeners for training the Pear upon walls exceeding eight or nine feet in height: in its various modifications it may be considered the most natural and even the nearest approach to the mode laid down by the late Mr. Knight, as affording evidence of a more regular distribution of the sap than any other. By Fan-training the loss of a branch can be more readily replaced than by horizontal training, and trees so trained will much sooner fill their allotted space of wall than by any other means. A variety of fan training the Pear upon high walls has been recommended by Hayward. "The principal variation in the mode," he says, "compared to those of the other authors, will be found in the position of the branches: in all but this, perhaps," he adds, "better instructions for general management cannot be given than those by Hitt; but, by attending to the position of the branches, and managing them as I have directed, the sap will be made to flow and extend itself through those buds which are placed in the proper situation to extend the surface of the tree; and when this is the case, there can be no occasion for waste pipes, or other superfluous branches." A considerable control, we think, will be exercised over the circulation of juices in trees trained

as above, by lowering or elevating the points of the branches: thus, when the tree is in too luxuriant a state, the extremities of the branches, instead of curving upwards, as shown in the Cut, should be made to take a contrary direction, and *vice versâ.*

Much has been written on the subject of training, and we may venture to say, some very absurd modes have been recommended, without producing any very advantageous results. The whole of the art, we think, may be summed up in the following few words. Rapid or strong-growing trees, whether they are naturally so, or rendered so by excess of stimulants, should be trained horizontally, or even pendent, that is, as far from the perpendicular as possible, that the sap may be moderated in the force of its ascent; while weak or slender-growing ones should be trained at different angles of elevation, between the horizontal and perpendicular, to produce the very opposite effect. Trees that have been trained horizontally or pendent, or at any angle between these extremes, upon appearing weak or unhealthy, should be altered to an angle of greater elevation; whereas, such as may have been trained nearly perpendicular, upon their becoming too robust or luxuriant, should be altered to a lower angle, to correct the rapidity of the circulation of the sap.

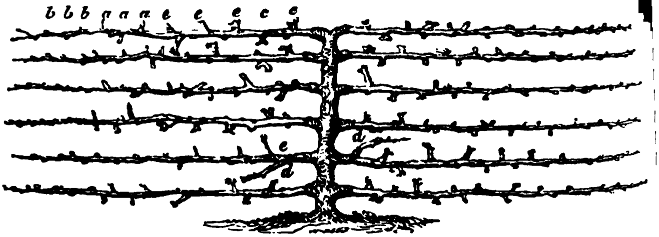
The above observations are in strict accordance with the opinion of Harrison (*vide Treatise,* &c., p. 39). "It is very evident," he says, "that to train those trees in the fan way, whose habit it is to produce already too much wood, will tend to the production of more, and that will be more luxuriant. In order, therefore, to bring such trees to a prolific condition, it is necessary that some means be employed with that express view. This may, in most cases, be effected by training them in a horizontal direction; for, when the branches are in this position, it checks the too free motion of the sap, and renders the tree productive of fruit; because the sap cannot proceed so quick in the branches as when they are trained more erect, and thus more time is afforded for the application of the juices in the spurs and buds, which are essential to fruitfulness. Although trees trained in this manner will generally be productive, yet if one should be so luxuriant that it will not bear freely, let the branches be trained so that they regularly incline towards the ground; and the more luxuriant the tree is, the greater must be their inclination. This will not only make such trees fruitful, but the fruit will also be finer; for, as all the branches are trained in a pendulous position, the sap is regularly distributed and properly employed in maturing the fruit and fruit-buds; whereas, if only a part of the branches were trained horizontally, and the remainder more erect, which is the case in fan training, the sap would flow more freely in such vertical branches, and the effect would be, in that part, the production of luxuriant unproductive wood; and, as the principal part of the sap would be expended where it had the least obstruction, consequently the other part of the branches would be weakly, and the wood small. This I have fully proved," continues the above authority, "both in trees trained the fan way, and also in some that were trained as espaliers, and which, in addition to the branches trained, I allowed to produce heads as standards. It evidently appeared that one part of the tree opposed the other, and this effect continued until the upper part of it was furnished with such a supply of branches as were proportionable to the quantity of food received; then the upper part of it became productive, and the other was weakly and unproductive. From these observations it will appear very evident, that to train such trees in the fan manner is acting in opposition to what is desired, viz., to bring the tree into a fruitful condition as soon as possible; and thus a much greater length of time is occupied in effecting this than would have been the case had the trees been properly trained from the time of planting." Mr. Harrison, who has had great experience in the management of fruit-trees, and who has very minutely detailed his practice, has made the following judicious remarks:—"When trees of these kinds are not vigorous, the fan method of training may, if desired, be adopted successfully. On the other hand, when a tree that has been trained in the horizontal plan comes weakly, I find it," he says, "of great advantage to let the branches have a little elevation towards the end for a year or two. When this practice is adopted, it generally is attended with success in giving strength to the tree. After it has acquired the vigour I wish for, I bring the branches to their usual horizontal direction. If they have been elevated a great deal, I only bring them down the first season half way, and the remainder the season following."

HEADING DOWN AND RENEWING OLD PEAR TREES.—The Pear tree, under good management, and in a favourable soil, may be continued in health, vigour, and productiveness, for a greater length of time than any other fruit-bearing tree; and few pear trees are either too old or too much neglected, providing the roots are healthy, but they may, by judicious management, be brought again into a state of health and productiveness. Forsyth was the first who carried this practice into general use; for, finding that the old pear trees in the Royal Garden at Kensington had become diseased, cankered, and almost barren, and reflecting that, had he planted young ones, it must have been twelve or fourteen years before he could have had a supply of fruit from them, he determined to try the following experiment upon his old trees:—" I began," says he, " by cutting down four old and decayed pear trees of different kinds, near to the place where they had been grafted: this operation was performed on the 15th of May, 1786. Finding that they put forth fine shoots, I headed down four more on the 20th of June in the same year (for by this time the former had shoots of a foot long), which did equally well, and bore some fruit in the following year." One of the first four, that is, one of those headed down on the 15th of May, produced nineteen fine large well-flavoured pears next year." We are induced to make the above, and also the following quotation, in consequence of the late season of the year when the operation was performed, as well as to show the success of the principle of heading down, which, though at one period rather averse to it, we are convinced, by subsequent experience, to be of great utility.

" On the 20th of June [Forsyth] headed several standards that were almost destroyed by the canker: some of them were so loaded with fruit the following year, that [he] was obliged to prop the branches, to prevent their being broken down by the weight of it. In the fourth year after these standards were headed down, one of them bore 2840 pears."

Lindley recommends pear trees which have been long neglected to be headed down in the following manner:—" In February, or the beginning of March, with a thin fine-toothed saw cut every branch back to within nine inches of the main stem from which it issued, making the cut in a sloping direction, and as little exposed to view in front as possible, smoothing it afterwards with a sharp knife, and particularly the bark round the edge, so that its lacerated parts may be effectually removed; at the same time every spur, whether good or bad, upon the remaining part of the tree, should be cut off close and smooth, but not so close as to touch the ring of the bark at its base, from beneath which the young shoots will make their appearance." The wounds are then to be covered with a little fine grafting clay, or with Forsyth's composition, to keep out wet, both of which to be applied in the state of paste, and to be laid on with a brush. When the young shoots appear, the best are to be selected, and fastened to the wall as they advance in growth. " If the branches headed down in the spring," Lindley continues, " had been at regular and proper distances from each other, two shoots from each will be double the number subsequently required. It is, however, necessary this number should be trained the first year, as they will grow as strong and extend quite as far as if half the number only had been retained, and it will give an opportunity of selecting the best shoot of the two in winter pruning, and, in case any accident happening to one, the other will supply its place; so that a full number of branches will thus be secured to furnish every part of the tree." We beg to differ, however, so far from the great authority above quoted, in regard to the propriety of leaving so many branches, as that must always be governed by circumstances. In a tree of robust and luxuriant growth, no doubt, the more branches laid in the better, because it will check over-luxuriance in them; but in one of slender and weak growth the fewer left the stronger will they be. It would be hazardous to lay down a general rule in this case, as so much depends on the state of the tree.

Forsyth has illustrated his mode of heading down old and decayed pear trees, and gives, as an example, a drawing of an old horizontally-trained Beurré, of which the annexed Cut is a copy, and the following quotation the description. This tree, it should be premised, was recovered, and long afterwards bore excellent crops of fruit, notwithstanding the stem was decayed, and only an inch and a half of the bark left. "The letters *a*, *a*, *a*, represent the fruit-buds for the present year; *b*, *b*, *b*, are those forming for next year; and *c*, *c*, *c*, the old foot stalks that bore the fruit last year; the small buds are beginning to form, which produce fruit the second year; and *d*, *d*, are the foreright shoots, as they appear before they are cut, which must be at *e*, close to a bud, and sloping towards the wall as much as you can, leaving them as regular as possible all over the tree."

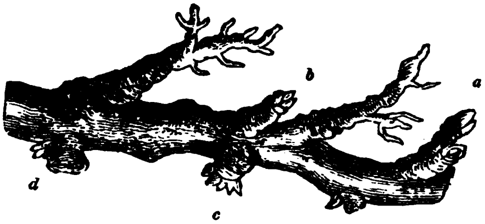


The following is his method of training horizontally such trees as are headed down near to the place where they were grafted :—" Every year, in the month of March, I shorten the leading shoot to a foot or eighteen inches, according to its strength: this shoot will, if the tree be strong, grow from five to seven feet long in one season; and if left to nature, would run up without throwing out side shoots. The reason for this shortening the leading shoot is, to make it throw out side shoots; and if it be shortened close to a bud, it will frequently cover the cut in one season, leaving only a cicatrix. When the shoots are very strong, I cut the leading shoot twice in one season: by this method I get two sets of side shoots in one year, which enables me sooner to cover the wall. The first cutting is performed any time during the spring, and the second about the middle of June."

Pear trees which have ceased to be healthy or productive, may be renovated by heading down either to near the ground, or the larger branches cut back to within a few inches of their origin; and, instead of allowing them to send out shoots of their own, grafts of the same sort may be used; or, if it be more desirable, for the sake of variety, or changing the kind of fruit, various approved kinds may be put on. It is the opinion of many, that the very circumstance of grafting even the same kind of scion on its own stock has a tendency, if not to improve the quality of the fruit, at least to increase its fertility: if such be the case, then the practice of heading down and grafting, particularly on strong and healthy roots and branches, must be better than merely allowing them to break into wood of their own accord. There is another advantage attending this mode, viz., that by judicious cutting down, and carefully attending to the proper arrangement of the scions, the future tree may be so modelled the first year as to render it a matter of little trouble afterwards. *(For mode of grafting, see* APPLE.)

SPUR PRUNING THE PEAR TREE.—The Pear produces its fruit on spurs, but these are, in general, allowed to extend beyond all reasonable bounds, and, in fact, to place the fruit that may be produced on them in a position little better than if they were grown upon open standards. Forsyth reprobates this practice, and observes, "The constant practice has been to have great spurs, as big as a man's arm, standing out from the wall from a foot to eighteen inches or upwards." To correct this habit his practice was to head down the trees, as already explained, and to renew the soil at their roots. Harrison cuts away partially, and afterwards wholly, the spurs at a very early period after they are produced, and gives the following reasons in justification of this practice. "Around the base of each spur there are generally several embryos situated under the bark; and, when the old spur is allowed to grow without being shortened, or entirely cut down, such embryos generally remain in that condition; but, if the spur be cut down, it will almost certainly cause one or more of these to push forth; and in some instances this will be the case even by partially shortening an old spur. The advantage, therefore, of cutting away the spur at an early age is,—that such embryo will more certainly push than if the pruning be deferred to a much later period; for the younger the wood is of the spur cut away, the more certain is the young spur of being produced; for, when the bark gets old, it is tougher, and the embryo cannot force its way through it so readily as it can when it is younger: besides, it will frequently be found, when the spurs have been allowed to grow for many years, and have not been cut away, that some of the embryos will have previously pushed; but, from the old spurs being allowed to remain, they had not received a due degree of support, and for want of it, and a due attention of sun and air, had perished. I have frequently observed this to be the case, and when such old spurs have been removed, vacant places have occurred at such places. These ought always to be avoided, as they look unsightly, and more particularly so when the spurs are far distant from each other. Another advantage is derived from taking away the spur at an early state, viz., that the wound caused by cutting it off is not so large as it would otherwise be, and it is also much sooner healed, and becomes nearly even with the branch from which the spur was removed; and thus those large protuberances, which are so very generally to be seen, are avoided, and the beauty, regularity, and fruitfulness of the tree are increased."

Harrison illustrates his theory by giving the annexed Cut, which represents an ordinary well-managed pear spur. A spur bears only once, and is then cut out, and is succeeded by an embryo bud (*d*), which is formed at its base. This embryo bud, at the end of the first season, only attains the state of a leaf-bud, as at (*c*); at the end of the second summer it has become a blossom bud, as at (*b*); and the third summer it is a fully-formed fruit bud, as represented at (*a*). This is the case with spurs that are allowed to become too old before they have been cut down, as the young spur in this case will produce nothing for the first two years but wood. The case is, however, different with spurs cut down at an early period, for these are almost certain to produce a fruit-spur the first year, and fruit the second. It also sometimes happens that an old spur,



when cut down, will not spur the first year, perhaps not the second, and, as Harrison observes, in some cases not at all. "But, besides those embryos situated near the base of the spur cut down, there will frequently arise new spurs along the branch in the intermediate spaces between the old ones; such must be retained and encouraged."

This we had a very striking instance of in the Claremont Gardens, in the case of some very old pear trees, whose spurs extended fully eighteen inches from the wall. These we had cut out as close as possible to the branch, from bottom to nearly the extremity, where there was, as is most generally the case, a few natural or young blossom-buds, which were suffered to remain. The season following this operation many young buds forced their way through the bark, which was of great thickness: the second season some of them became perfect fruit-buds, and blossomed freely; but a late spring frost cut most of them off, so that we had but few fruit: the third season the majority of these buds showed flowers, and a very fine crop of pears followed. Since that period we have never encouraged the formation of artificial spurs, by shortening back the young breast-wood in summer to within an eye or two of the point from whence it issued. We have, on the contrary, cut out the breast-wood every winter close into the old branches, and, by dispensing with artificial buds, have had natural ones produced in abundance.

Trees upon proper stocks, planted in soils neither too deep nor rich, and treated in the above manner, will produce abundance of fruit, and always look much better than such as are permitted to send out spurs, which are in general allowed not only to extend too far from the wall, but to become so crowded, that what with their foliage and the useless spray which they yearly produce, the tree becomes exhausted, and the fruit is deteriorated from want of a free circulation of air, and excess of shade. Those who may not have sufficient confidence to cut away the large old and almost useless spurs entirely, should, at all events, greatly retrench them both in number and size. No fruit-spur should extend beyond three or four inches from the wall, and if at nine inches distance from each other, they will be thick enough.

Upon this subject Harrison offers the following practical remarks:— "In order to effect this object, at the winter pruning a great number of the spurs must be cut down to about half an inch from the origin of each; but if some of these branch spurs have a lateral spur situated within two inches of their origin, such spurs must be pruned off just above each lateral one alluded to. The quantity of spurs to be left untouched must be one every six inches: these must be trained to the wall, between the main branches, alternately along them; so that there will be twelve inches or upwards from spur to spur of those trained in at the same side of each branch. The distance here described is most suitable for plums and cherries, but apples and pears must be sixteen inches apart. If there be any lateral spurs upon those branch spurs to be trained in, which are a hinderance to the spur being nailed close to the wall, let such parts be pruned away. The lateral spurs upon those branch spurs nailed in, will, during the following summer, mature a great portion of fruitful buds, and they will generally bear fruit abundantly the second summer. From the remaining part of those branch spurs, which were cut down to half an inch as directed, there will frequently arise a new spur from each the first and second year; such must be afterwards treated in every respect according to the instructions given in treating upon each fruit tree respectively. If, upon any of those spurs cut down to two inches from their origin, there should be a fruitful bud or shoot produced near to the origin of the old spur, let all that part of the spur above such new bud or shoot be pruned entirely away at the following winter pruning. In addition to new spurs being produced from the old ones cut down, a great many shoots or fruit buds will frequently arise along the main branches, where spurs were not situated before. In making choice of spurs nailed to the wall, choose the cleanest and most healthy, and such as are at the sides of the branches which they are produced from; so that they can be trained to the wall without having to force them much from their natural direction."

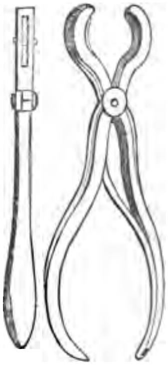
And farther, on this subject, Lindley observes,—" The spurs of pears, indeed, require the principal part of the gardener's attention in the management of the tree, for on these depend the bulk and value of the crop: short spurs, at a moderately wide distance, produce fine fruit; while those on long ones, in a crowded state, are proportionably inferior: on the contrary, very vigorous sound spurs, at wide distances, produce fruit of the very largest size, and the greatest excellence."

PRUNING THE ROOTS.—This is one of the many modes of treatment practised on unproductive and too luxuriant-growing pear trees; and although an old practice, does not appear to have been so generally attended to as it deserves. This species of pruning may be advantageously employed in the case of trees which are sickly or diseased, owing to their roots penetrating into a wet, cold, or otherwise uncongenial subsoil, and also when the roots penetrate too deeply even into a good or over-rich soil. In the former case are produced canker, cracking of the bark and skin of the fruit, which latter also becomes stony or gritty, the production of weak and immaturely-formed shoots, shedding the fruit at the season of the seeds forming, and not unfrequently total barrenness. In the latter, the production of strong watery shoots, which grow to a late period of the season; and from that cause, and the superabundance of sap contained in them not ripening perfectly in autumn, the almost universal production of wood-buds, instead of fruit ones, the trees extending over a large surface, and continuing perfectly barren, are the most prominent symptoms. To correct both these habits much may be done by a judicious system of pruning the roots; and in the former case means should be employed to prevent the roots from descending into a bad subsoil, such as laying pavement, bricks, or tiles under them: richer mould should likewise be added; all perpendicular roots should be shortened, and receive a horizontal direction, to keep them in a proper soil, and near the surface. Besides, cutting back long and naked roots will cause them to send out many fibres, which are the true collectors of the proper food for the tree. Where an excess of luxuriance exists, cutting back the roots, keeping them near the surface, and when the soil is too rich, adding light sandy mould to correct that excess of nourishment; and even taking up the tree entirely, and replanting it, will all be found to have most beneficial effects. The roots of any tree may be completely pruned by degrees, if it be deemed imprudent to perform the whole operation at the same time. "Say that the roots extended in every direction, in form of a circle: then take a portion, say one-eighth, of that circle every year, till it be completed, and remove the earth entirely from above and under the roots: then cut off the diseased parts, or those roots which penetrate into a bad soil; and, laying below them such a stratum as shall be impenetrable by them in future, intermix and cover them with suitable soil."—*Ency. of Gard.*

This operation is usually done during winter, spring, or autumn, but an instance to the contrary came under our own observation many years ago, which was practised by Mr. Beattie, late gardener to the Earl of Mansfield, at Scoone Palace, and published by him in the *Memoirs of the Caledonian Horticultural Society*, vol. i.: it is to the following effect:— "In the beginning of July, 1811, I had a border on the south wall of 400 feet long, trenched to the depth of from two and a half to three feet: in doing this, I had the opportunity of cutting the roots of all the trees, as the work went on, which I did so completely that they in a manner hung by the nails and shreds, with a ball of earth about two feet from the stem of the tree." This cutting of the roots had the effect of lessening the luxuriance of the trees, which before that grew very rapidly, and produced few or no fruit; they, however, afterwards became less luxuriant, and produced plentiful crops for many years.

Ringing the Stems and Branches.—This is a species of mutilation which nothing but extreme necessity should induce us to put into practice. It is an operation of very ancient date, as we find it mentioned in the writings of Virgil, Columella, and others. It appears to have been revived about the beginning of the eighteenth century, by Du Hamel, and to have been pretty extensively practised on the continent from that period to the present time. Dr. Darwin, in Phytologia, notices the art, and Dr. Nohden, in 1817, brought it before the notice of the Horticultural Society. Ringing is of two sorts, the one called production ringing, and the other maturation ringing: the former is practised for the purpose of inducing blossoms on trees, or rendering them productive, and the latter for accelerating the maturity and increasing the size of fruits. The former should be performed in the spring, and its effects will be shown the following year; the latter, when the trees are in blossom, to produce its effects the present year.

The operation of ringing is performed by cutting out a ring of the outer and inner bark with a sharp knife, or ringing shears, of a breadth not more than the tree can fill up, if peaches or other stone fruit, in one year, and if pears or similar kernel fruit, in two, or at most three, years. If the ring cut out be of greater breadth, the top will, in all probability, after a year or two, die, while the part under the ring will become very luxuriant, and of course have to form a new top, as if it had been headed down.



A. Hempel, a German author who, by the by, so late as 1815, published his practice of ringing as an invention of his own, states, as a consequence resulting from the practice, that young trees will be forced to show fruit much earlier than they otherwise would do. But Mr. Loudon, with great propriety, remarks, "That ringing may have some effect in this way, but by no means so much as is ascribed to it by Hempel. Trees must arrive at their age of puberty, like animals, before they can propagate their species. Abundance of food and heat will, no doubt, induce a degree of precocity in the subjects of both kingdoms, and as ringing gives abundance of food to the particular part above the excision, it must have some effect, but it has not been proved to have much. Ringing will produce blossoms in all plants, herbaceous or shrubby, propagated by extension, that is, originated otherwise than from seed, *at any age;* but its effects on young trees raised from seeds, or in causing blossoms on any description of tree to set, are much less certain; though in all cases where they do set, the size of the fruit will be greatly enlarged for the first year or two."

VARIOUS SPECIES OF MUTILATION PRACTISED ON THE PEAR TO INDUCE A STATE OF FRUITFULNESS.—Besides ringing, the following species of mutilation are sometimes practised on barren and unblossoming trees, viz., transplanting frequently, partial decortication, cutting notches in the stem and larger branches, laying bare the roots, boring a hole in the trunk and inserting an oaken plug, all of which practices have been resorted to as expedients, but they sooner or later hasten the decay of the tree, and with the exception of transplanting we hope will soon become known to horticulturists only as the practices of former days. The only true mode of insuring health, longevity, and abundance of fruit, is by supplying proper soil and exposure, and by judicious pruning and training.

Transplanting trees frequently amounts to about the same thing in regard to effect as pruning the roots, and improving the soil, already treated on, and there can be no doubt of the utility of the plan under many different circumstances. This mode is often had recourse to on the continent, and is well spoken of by Van Osten, a Dutch author, who also recommends boring a hole in the trunk, &c., which we quite disapprove of. Laying bare the roots is at this day held in some repute in Belgium, France, and Germany, and was also practised in this country at one time, as we find it recommended by the older authors under the name of Ablaqueation, from *ablaqueo*, to lay bare, as it is performed by laying bare the bottom of the stem and the principal roots, in order to render the trees more fruitful. Cutting notches in the stem or branches is another barbarous mode of mutilation, and, like the practice of stripping off pieces of the bark, should be discarded from modern practice.

INSECTS.—The Pear, being a more hardy and longer-lived tree than the apple, is much less liable to be attacked by insects or disease. Perhaps the most annoying in this respect is a species of coccus, which quits the branches and attaches itself to the skin of the fruit. This insect is also common on the apple tree in some gardens, and it is probable that it is the same which often attacks the plum, although Reaumur thinks the latter a distinct species, and describes it under the name *Coccus persicorum.* The most effectual mode of clearing the wood of trees attacked by this insect, is to scrape them off with a wooden knife during winter, and after rains, when the trunk is somewhat softened. Many wash the trees with soap suds and urine, applied with a hard, worn-out painter's brush, but this washing has no other effect than merely to soften the bark, and render the insects more readily removed by the process of scraping. It is not unusual to see trees wholly incrusted with this coccus; in such cases we would recommend the branches to be cut back to near their origin, and completely eradicate every vestige of the insect from the stem and parts of the branches left.

DISEASES.—These are few, compared to those of other fruit trees. The canker is perhaps the only disease calculated to create alarm, and even this is often, perhaps always, brought on by accident, neglect, or injudicious treatment, for we cannot admit it to be in all cases a constitutional disease. As in the case of the apple, the canker is often brought on by injudicious pruning, leaving the wound ragged, and thereby admitting water into the wood, which soon after begins to decay; from injuries sustained by the bark being bruised by applying ladders while gathering the fruit; from the shreds being too short and pressing too closely on the bark; from allowing the young wood to remain which has become diseased; from its being imperfectly ripened in bad autumns, and, according to Forsyth, from leaving the foot-stalks of the fruit on the trees after the crop has been gathered. It is a very general opinion, but not always founded on facts, that the disease arises from the nature of the soil in which they are planted, such as sour clays and cankering gravels. It proceeds in general from the branches to the roots, and very seldom from the roots to the branches.

THINNING THE FRUIT.—This is a branch of fruit culture too much neglected, and hence we find that trees which are allowed to bear too many fruit one year, seldom produce any, or at least only a few, for the two or three following seasons. A judicious thinning is not only necessary to increase the size of the fruit, but it also enhances its flavour, and tends to promote the annual productiveness of the tree. Weakly-growing trees should be very much thinned, because they usually set more than healthy and vigorous-growing ones, and if they are permitted to carry all them set, it would tend to weaken them still more, until at last they erish altogether; whereas luxuriant-growing trees should be carry greater crops, as it will have a tendency to check their r, and bring them into a more productive state.

be impossible to say how many fruit each tree should be allowed to carry, or at what distance they should stand apart, as so much depends on the state of the tree, the size of the fruit, &c. Large fruiting kinds should be less numerously loaded, while smaller-growing sorts may be allowed to carry a greater number. A foot or fifteen inches apart, taking the whole bearing surface, will be crop sufficient for the former, and half that distance may be considered a pretty good medium rule for the latter.

GATHERING AND PRESERVING.—Summer pears, that is, those kinds which ripen on the tree, require to be carefully gathered and laid upon the shelves of a well-ventilated and cool fruit-room. They are fit to gather when they begin to fall, and give out their perfume, or when their seeds begin to turn to a brownish colour. This section of pears is held in less estimation than those that will keep during winter, when the fruits are less plentiful; they are, therefore, both fewer in number of varieties, and are not so generally cultivated.

The autumnal and winter-keeping sorts are those to which the following observations will chiefly apply. The autumn sorts are to be gathered as they successively ripen, and this should be done only on dry days, when both leaves and fruit are as dry as possible. They should be laid carefully in flat baskets as gathered individually by the hand, carried to the fruit room, and placed on the shelves in a single layer, where they are to remain till used. The winter-keeping kinds require all the ripening our climate will afford, and, therefore, should remain on the tree until the appearance of frost renders it necessary to gather them. Here we may observe that hot walls become of great importance, not only by protecting the later kinds from slight frosts during the night, but also if heated during cold and wet autumns, even during the day, from the beginning of October till the beginning of November, the late ripening fruit would not only be much benefitted, and brought to almost as great perfection as they are in France, and the Islands of Jersey and Guernsey, but the buds and young wood would also become more perfectly matured, and better fitted for the production of fruit the following season.

It frequently happens that, during October, warm days are succeeded by pretty sharp frost at night: it can, therefore, be hardly necessary to enlarge on the advantage that would arise from covering the choicer kinds of winter pears, during such cold nights, and uncovering them during the day; this mode of assisting their ripening would be of advantage on common walls, as well as on those which are heated. It must, however, be observed, that frost should not be permitted to reach them while on the tree, for although, when apples and pears are completely frozen through in the fruit-room, and allowed to thaw again, in the dark, in a gradual manner, it has been found by experience to have little effect upon them; still, if they be frozen while on the tree, or if taken from the fruit-room in that state and thawed in the light, and in a high temperature, decomposition takes place almost immediately. The greatest care should be taken in gathering Pears so that they be not bruised, and also that the finest specimens be selected of each sort to be packed by for winter and spring use, as will be directed below. The smaller ones need not be taken the same care of, as they are seldom so well-flavoured, nor will they keep so well as those that are fully matured.

On the subject of keeping the finest kinds of pears, much has been written of late years. The various papers on this subject, by the late T. A. Knight, Esq., are highly philosophical, and merit the particular attention of the fruit gardener. Fruits which have grown upon standard trees, in climates sufficiently warm and favourable to bring them to maturity, says that intelligent pomologist, " are generally more firm in their texture, and more saccharine, and therefore more capable of being long preserved sound, than such as have been produced by wall-trees; and a dry and warm atmosphere also operates very favourably to the preservation of fruits, under certain circumstances, but under other circumstances very injuriously; for the action of those electric attractions, which occasion the decay and decomposition of fruits, is suspended by the operation of different causes in different fruits, and even in the same fruit in different states of maturity. When a grape is growing upon the vine, and till it has attained perfect maturity, it is obviously a living body, and its preservation is dependent upon the powers of life; but when the same fruit has some time passed its state of perfect maturity, and has begun to shrivel, the powers of life are probably no longer, or at most very feebly, in action; and the fruit appears to be then preserved by the combined operation of its cellular texture, the antiseptic powers of the saccharine matter it contains, and by the exclusion of air by its external skin; and if that be destroyed, it immediately perishes. If longer retained in a dry and warm temperature, the grape becomes gradually converted into a raisin, and its component parts are then only held in combination by the ordinary laws of chemistry." A pear "exhibits all the characters of a vegetable living body long after it has been taken from the tree, and appears to possess all the powers of other similar vegetable bodies, except that of growing, or vitally uniting to itself other matter; and the experiments which Mr. Knight proceeds to state below prove that the pear is operated upon by external causes nearly in the same manner after it has been detached from the tree as when it remains vitally united to it." Some of the best continental pears, "particularly the Poire d'Auch, are much subject, when cultivated in a cold and unfavourable climate, to crack before they become fully grown upon the trees, and consequently to decay before their proper season, or state of maturity; and those which present these defects in my garden are therefore always taken immediately from the trees to a vinery, in which a small fire is constantly kept in winter, and they are there planted at a small distance over its flue. Thus circumstanced, a part of my crop of d'Auch pears ripen, and will perish, if not used, in November, when the remainder continue sound and firm till March or April, or later; and the same warm temperature which preserves the grape in a slightly shrivelled state till January, rapidly accelerates the maturity, and consequent decay, of the pear. By gathering a part of my swan's-egg pears early in the season, selecting such as are most advanced towards maturity, and subjecting them, in the manner above mentioned, to artificial heat; and, by retarding the maturity of the latter part of the produce of the same trees, I have often had that fruit upon my table nearly in an equal state of perfection from the end of October to the beginning of February; but the most perfect in every respect have been those which have been exposed in the vinery to light and artificial heat as soon as gathered."

Such is the rationale laid down by that eminent horticulturist, in regard to the theory of keeping and ripening the Pear. The following quotation is the essence of his practice of preserving both apple and pear, which he states to have been perfectly successful: his plan has been to place them "in glazed earthen vessels, each containing about a gallon, and surrounding each fruit with paper; but it is probable that the chaff of oats, if free from moisture, or any offensive smell, might be used with advantage, instead of paper, and with much less expense or trouble. These vessels, being perfect cylinders, about a foot each in height, stand very conveniently upon each other, and thus present the means of preserving a large quantity of fruit in a very small room; and if the spaces between the top of one vessel and the base of another be filled with a cement composed of two parts of the curd of skimmed milk, and one of lime, by which the air will be excluded, the later kinds of apples and pears will be preserved with little change in their appearance, and without any danger of decay, from October till February or March. A dry and cold situation, in which there is little change of temperature, is the best for them; but I have found the merits of the pears to be greatly increased by their being taken from the vessels about ten days before they were wanted for use, and being kept in a warm room; for warmth at this, as at other periods, accelerates the maturity of the Pear: the same agent accelerates its decay also; and a warmer climate cannot contribute to the superior success of the French gardeners, which probably arises only from the circumstance of their fruit being the produce of standard or espalier trees."

Hitt, who published his *Treatise on Fruit-trees* in 1757, after laying his fruit in heaps in the fruit-room to sweat, selects the largest and finest, and having wiped them dry with a linen cloth, packs them in earthenware jars, between layers of well-dried moss (various species of *Hypnum*). When the jars are full, they are stopped with plugs as close as possible, and buried a foot or more in sand. The advantage of using moss appears to be, that should any of the pears decay, the humidity of the decayed fruit will be absorbed by the dryness, and so prevent the others from being affected.

Sand, paper, sawdust, chaff, charcoal, peat-earth, coal ashes, &c., have all been used to pack fruit in; and small earthenware vessels, from a gallon size and upwards, as well as air-tight barrels, boxes, and casks, have also been tried for this purpose. Of these, dry sand, charcoal, peat-earth, and coal ashes, are, in our opinion, the best medium in which to pack the fruit: the more choice, however, should be enveloped in clean soft paper, and the vessel should be of a size to contain only about as many fruit as may serve for the consumption of one or two days. Fruit packed in this way may be kept in any dry cellar, cave, out-house, or be sunk under-ground in a dry soil, or in any other situation where the temperature is uniform, and rather low than otherwise.

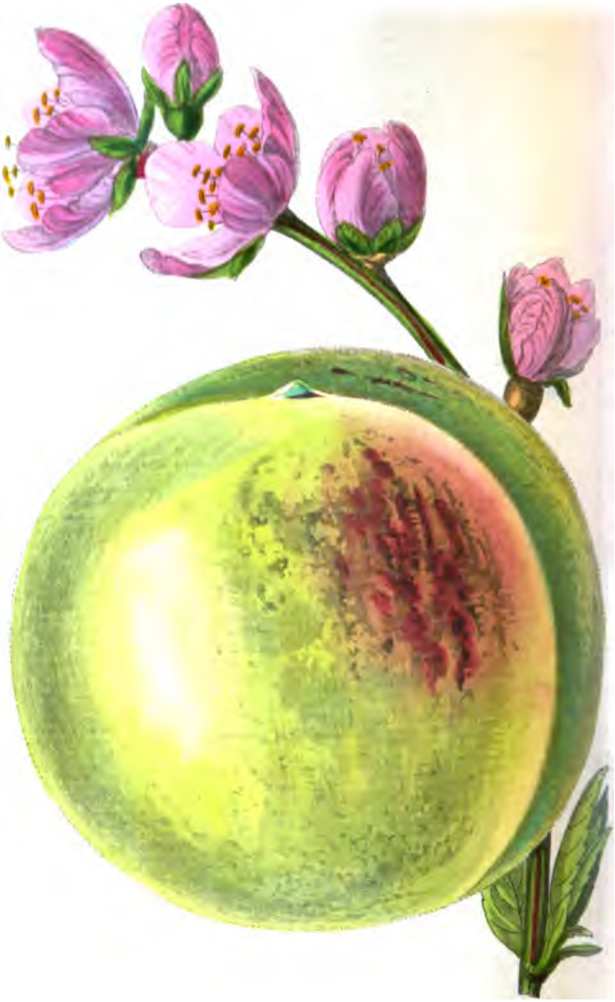
The late Mr. Ingram, while gardener to the late Sir James Erskine, of Torry, was most successful in growing the Pear, and also in keeping the fruit for a long period after they were gathered; an account of which he published in one of the early numbers of the *Memoirs of the Caledonian Horticultural Society*, the essence of which is quoted in the *Encyclopædia of Gardening*, and is as follows. Mr. Ingram "finds, that for winter pears two apartments are requisite, a colder and a warmer; but the former, though cold, must be free from damp. From it the fruit is brought into the warmer room, as wanted; and, by means of increased temperature, maturation is promoted, and the fruit rendered delicious and mellow. Chaumontelles, for example, are placed in close drawers, so near to the stove that the temperature may constantly be between sixty or seventy degrees of Fahrenheit. For most kinds of fruit, however, a temperature equal to fifty-five degrees is found sufficient. The degree of heat is accurately determined by keeping small thermometers in several of the fruit drawers, at different distances from the stove: the drawers are about six inches deep, three feet long, and two broad; they are made of hard wood, fir being apt to spoil the flavour of the fruit. They are frequently examined, in order to give air, and to observe the state of the fruit, it being wiped when necessary. The same authority remarks, "that in Scotland particularly late pears should have as much of the tree as possible, even although some frost should supervene: such as ripen freely, on the other hand, are plucked rather before they reach maturity."

Mr. Robert Thompson, of the London Horticultural Society, has found that both pears and apples keep longest when packed in dry fern, in boxes or hampers, and placed in a dry shed or cellar, where but a slight change of temperature takes place.

Our own experience in this matter favours the plan of placing the fruit carefully in large flower-pots or similar vessels, without any packing whatever, and excavating a pit, say from three to four feet in depth, in a dry bank, and of a length and breadth sufficient to hold the quantity intended to be longest preserved. The pots, being covered with a slate or large tile, are then buried by having the mould taken out of the pit laid over them, and finished off in form of a ridge, for the more completely throwing off the rain. Here they are to remain until wanted for use, when one pot or two only at a time is taken out. As fruit kept in this way will not last long, when exposed to the action of the atmosphere, in placing them in the pit they should be arranged as nearly as possible to their periods of ripening, so that they can be taken out in the same order.

Much difference in opinion exists in regard to the necessity or advantage of sweating the fruit previous to its being packed. Some disapprove of the practice, and say that the flavour is thereby considerably injured, and that the fruit does not keep so well; while others contend, and not without apparent reason, that, by getting rid of a portion of moisture, the fruit keeps better, and retains its natural flavour uninjured. We have made many experiments to ascertain this point, without being able to arrive at any very satisfactory conclusion: we think, however, that an excess of sweating must be extremely injurious, and bring on a disposition to decay much sooner than if the process were omitted altogether.

The ordinary kinds we prefer to keep on the shelves of the fruit room, in single layers, so that any which begin to decay may be easily picked out. Where there is not the convenience of a fruit-room, packing them in boxes or hampers, in dry fern or sand, or individually enveloping them in soft paper, will be found both convenient and successful. Cellars, if dry, and not subject to become heated from any cause, are much better situations for keeping fruit in than lofts or garrets, their temperature being much less liable to change; and, as a low and uniform temperature is the means of preservation for all fruits, the necessity of a due attention to this particular will be at once apparent.



Noblesse Peach.

THE PEACH.

The Peach, *Amygdalus persica*, is a native of Persia and China; in its natural state it only attains the size of a small tree of rapid growth, but of short duration. This fruit seems to have been cultivated from the earliest ages in Asia, but how or in what manner it reached Europe is not very certainly known; the probability is that the Romans brought it direct from Persia into Italy about the time of the Emperor Claudius, and from thence it could easily have found its way into Britain, where it is recorded to have been found about the year 1550.

Columella is the first author who has noticed the Peach. Pliny, in his b. xv., c. xiii., mentions that they were said to possess venomous qualities, and that the king of Persia had sent them into Egypt with the intention of poisoning the inhabitants, with whom he was at that time in a state of warfare. Indeed, most of the ancient writers describe this fruit as possessing deleterious qualities.

> "And apples, which most barbarous Persia sent,
> With native poison arm'd, (as fame relates);
> But now they've lost their power to kill, yielding
> Ambrosial juice, and have forgot to hurt,
> And of their country still retain the name."—*Columella*, b. x.

That the cultivated peach possesses no such properties is well known; the assertions of the ancients must therefore have arisen either from superstitious ignorance, or the fruit alluded to may have been swollen almonds the *Persea* of Pliny), as has been conjectured by the late Mr. Knight, as these are known to contain prussic acid in considerable quantities.

Virgil was an admirer of this fruit, and has not failed to mention it in his writings.

> "Myself will search our planted grounds at home
> For downy peaches and the glossy plum."

It appears that the Peach was received into France long before it was known in Britain, a circumstance which need not surprise us when the relative position of both countries is considered. Pliny speaks of the French and Asiatic peaches bearing the names of the regions and nations from whence they came, and Columella says—

> "Those of small size to ripen make great haste;
> Such as great Gaul bestows observe due time
> And season, not too early nor too late."

Gerard and Tusser are the earliest British authors who notice this fruit; the former describes the white, red, and yellow peaches, and also the avant peach, which he informs us were all growing in his garden, with many others. The latter enumerates, in his list of fruits, red and white peaches, and succeeding authors increase the number, for we find Parkinson, in 1629, enumerating twenty-one; Miller, in 1750, thirty-one, and, finally, Mr. G. Lindley, in 1831, describes sixty different sorts; and the American peach-growers far exceed that number, eighty-eight different varieties being described as under cultivation in that country.

The climate of America and France is evidently much more favourable for the growth of the Peach than that of Britain, for in those countries the fruit ripens well upon standard trees. Indeed, it is no unusual thing to see an American peach orchard containing one thousand trees growing as standards, as the apples do with us, and after the juice is fermented and distilled producing one hundred barrels of peach brandy. The Americans usually eat the pavies or cling-stones, while they reserve the melting or free-stones for feeding their pigs. These trees with them are seldom budded, but are raised from the kernel, which is not unfrequently planted, and allowed to remain where it is to produce its fruit,—hence the great chance of obtaining new or improved varieties; but these, like many of the best apples from the same country, seldom succeed so well with us as those originated either in Britain or in France. Indeed, the peaches from the latter country are far superior to any other with which we are acquainted; and those obtained from Montreuil, a village near Paris, where the whole population has been engaged in the culture of the Peach for ages, are considered the best, as is also the routine of management. In the United States the stones of the Peach are sown on a seed bed pretty thickly, and such of the young plants as have the largest leaves and strongest wood are usually selected, and planted out where they are to remain. In the fourth or fifth year they produce fruit, and thus thousands of sub-varieties are produced; not one perhaps in ten thousand is fit for the table, but most of them are left to produce fruit for making brandy, and, as we have said, for feeding pigs.

Whether the Peach be really indigenous to America, or introduced there, as well as the time of its introduction, is not known with certainty. Father Hennepin, who has given us the first description of the regions of Louisiana, in his voyage down the river Mississippi, describes the peach trees he observed in all parts of those regions as being of immense size, which has led some to think that, as those latitudes correspond with the part of Asia where this tree is deemed indigenous, they are natural to Louisiana also; nevertheless it is also possible that they may have been introduced to other parts of America, from Europe, before Louisiana had been explored.

Botanists regard the peach and nectarine as only slight varieties of each other, and not as distinct species. Various instances are recorded of both fruit not only being produced upon the same tree and on the same branch, but also of a single fruit partaking of the nature of each. The French cultivators are unanimous in considering them as one species of fruit, which they have arranged into four divisions, namely, 1st, the *Pêches*, or free-stone peaches, that is, those whose pulp or flesh separates freely from both skin and stone. 2ndly, The *Pêches lisses*, or free-stone nectarines, or free-stone *smooth* peaches. 3rdly, The *Pavies*, or cling-stone peaches, whose flesh is firm, and adheres both to the skin and stone. 4thly, The *Brugnons* or nectarines, or cling-stone smooth peaches.

The French gardens possess many fine varieties of peaches, and the best collection in that country will be found in the Luxembourg garden, at Paris, where about seventy varieties are cultivated. Poiteau, in *Le Bon Jardinier*, the Count Lelieur, in his *Pomone Française*, and Duhamel, in *Traité des Arbres Fruitiers*, vol. ii. p. 1, &c., were the first who attempted any thing like a systematic arrangement of peaches; and our countrymen Miller, Robertson of Kilkenny, and the late Mr. George Lindley, the father of the eminent botanical professor, have also formed very ingenious and interesting arrangements. The former founded his arrangement upon the sawed, crenate, or smooth form of the leaves, and the size of the flowers, separating the peaches with downy skins from the nectarines with smooth skins, and those whose flesh adheres to the stone from those which separate freely from it. Such also was the mode of classification used by Duhamel. Poiteau and the Count Lelieur extended the range of their classification, and in addition to the distinctions made use of by Miller and Duhamel, they included a third division of flowers, and two different characters in the glandular leaves. They place, however, too much stress on the fruit, which formed the basis of their classes. In the excellent arrangement established by Lindley, he founds his classes on the leaves and the divisions of the flowers, in the following perspicuous manner:—Class 1. Those whose leaves are deeply and doubly toothed, and having no glands on or near the footstalk. Class 2. Those whose eaves are crenated, and have globular glands on or near the footstalk. Class 3rd. Those whose leaves are crenated or sawed, and having kidney-shaped glands on or near the footstalk.

These classes he divides into divisions, sub-divisions, and sections, the former founded upon the size of the flower, which he divides into three sizes, viz., large, middle, and small. The sub-divisions are two, viz., PEACHES and NECTARINES, and the sections also into two, viz., cling-stones, and melters or free-stones. Mr. Lindley's arrangement is simple and clear, and will be found detailed at length in the *Transactions of the London Horticultural Society*, vol. v. He has also published it, with some corrections and amendments, in his *Guide to the Orchard*, &c. As nothing satisfactory can be accomplished towards settling the nomenclature of fruits until some arrangement be adopted, we hope we may be pardoned for giving publicity to one other mode of arrangement, the invention of Mr. Robert Thompson, of the Horticultural Society's gardens. Mr. Thompson divides these fruits into two grand divisions, viz., Peaches and Nectarines: each of these he divides into cling-stones, and melters or free-stones, which form his sub-divisions or classes. These classes are separated into three divisions, the first having the leaves serrated and glandless; the second having the leaves crenated or serrulated, with globose glands, and the third having leaves crenated or serrulated, with kidney-shaped glands. Each of these is divided into two sections, the one having large flowers, the other small flowers. Nothing can be more simple, perfect, and comprehensive than this arrangement.

The medical properties of the Peach have been variously estimated:

the leaves containing a portion of prussic acid, when steeped in gin or whiskey, communicate to it a flavour resembling noyeau: they are also used by cooks to give that flavour to custards, puddings, and blancmanges. The flowers, when made into a syrup, are given as an aperient to children, and are said to have the property of destroying worms, a property ascribed to them so early as the days of Gerard, who says, "the leaves of the peach tree, boiled in milk, will destroy the worms in young children." The wood of the peach tree produces the colour called rose-pink; we are not aware of its being applied otherwise in the arts.

The fruit makes a very delicious preserve, either for the purpose of being eaten as dried fruit, or for cooking; the following mode of drying them is practised in America. A small room, fitted for the purpose, is used, provided with a stove, with drawers in the sides, lathed at the bottom, with intervals between. The peaches should be ripe, and cut in two, not peeled, and laid in single layers on the laths, with their skin downwards, to save the juice. When the drawer is closed they are soon dried by the hot air of the stove.

Varieties.—In 1573, Thomas Tusser mentions peaches, white and red; in 1629, Parkinson enumerates twenty-one sorts: Miller, in 1750, describes thirty-one varieties; Forsyth, in 1806, describes forty sorts, and adds a list of twenty-seven sorts more, with which he appears to have been unacquainted; Langley, in 1729, describes and figures thirty-four kinds; Lindley, in 1831, sixty; Rogers, in 1834, thirty-two, and the Encyclopedia of Gardening, last edition, also thirty-two sorts, exclusive of nectarines.

SELECT LIST OF PEACHES.

1. Belle Chevreuse.—Size, medium; colour, flesh-colour, marbled with a darker colour on the side next the sun, greenish white on the shaded side; leaves, crenated; flowers, middle size; glands, kidney-shaped; pulp, white, but reddish next the stone; flavour, good; form, somewhat oval, remarkable for the downyness of the skin, which its name imports; tree, healthy, but not a vigorous grower, and does well in pots; succeeds best on the the Brompton or pear plum stock: the French cultivate a late Chevreuse, but it is not adapted to the climate of this country; ripens in the neighbourhood of London about the beginning of September. It will be proper to observe here, that fruits do not in all seasons ripen at the same time; sometimes they are fourteen or sixteen days earlier than at others, nor must they be expected to ripen in all parts of Britain alike. Soil, situation, and climate make a wonderful difference in this respect, which must have been noticed by every gardener of observation and intelligence. We have noticed in many cases the periods they ripen at near London, as most of our observations in this treatise have been taken from memoranda made at Claremont, which is by no means so early as the

neighbourhood of London, although only fifteen miles distant, in a westerly direction.

2. Bellegarde. [*Syn.*, Galande, Early Galande, Noire de Montreuil, Violette Hative, Brentford Mignonne, Smooth-leaved Royal George, Ronold's Brentford Mignonne, Reynolds.]—Size, above medium; colour, rich, deep red, streaked with dark purple or violet on the side most exposed to the sun, pale green, tinged with yellow, where much shaded; form, nearly round; flowers, small; leaves, crenated; glands, globular; pulp, pale yellow, slightly reddish towards the centre; stone, rather large; free-stone; tree, healthy, of moderate growth, a prolific bearer. Rogers says, the pear stock is the only stock fit for this sort, and farther recommends planting it in peach houses, where a late supply is required, as it has the property of ripening its fruit in succession, and not all at once, as is the case with most other peaches. Upon walls, particularly in late situations, it should have a favourable place to insure its ripening; and still farther, the young wood should be kept thin and close to the wall. It may be questioned how far it would be advisable to plant it to any extent as an open wall tree in Scotland. In the south of England it is one of the very best peaches, and should have a place in every peach house in the kingdom.

3. Chancellor. [*Syn.*, Chancelliere, Noisette, Late Chancellor.]—Size, large; colour, fine red on the sunny side, light yellow where shaded; form, somewhat oval; leaves, slightly toothed; flowers, small bright red; glands, kidney-shaped; pulp, pale yellow, bright red next to the stone; flavour, excellent; free-stone; ripens towards the end of September. This variety succeeds best upon the pear plum stock, and, like all late peaches, should be planted on a dry soil; tree, healthy, although not usually a strong grower, but is an abundant bearer, and excellent fruit. This peach is said to have been raised from seed, by M. de Seguier, Chancellor of France.

4. Catharine.—Size, large; colour, beautiful red, marked with a darker colour on the side most exposed to the sun, yellowish green, thickly spotted with bright red dots, on the side next the wall; form, somewhat oblong, more swollen on one side of the suture than on the other, which gives it a nipple-like termination, as in the Noblesse; leaves, slightly toothed; glands, kidney-shaped; flowers, small dark red; pulp, firm, yellowish white, red at the stone; flavour, excellent, when fully ripened; cling-stone; ripens in October and November, and even then requires a warm situation upon the wall. It is not a peach for the open air of Scotland, unless planted against a hot wall. Its large size and showy appearance demand for it a place in every extensive peach-house. Lindley observes, "that there is no doubt of this being an English peach; but it appears from an old catalogue of the Chartreux Garden, that it was long since sent to France, under the name of La Belle Catharine, although no trace of it is to be found in the great French works on pomology." Kyle, Forsyth, and Nicol, recommend this peach for forcing, while Rogers greatly disapproves of it for that purpose. Our opinion is that it is not fit for early forcing, but is an excellent peach for a late peach-house.

5. Bourdine. [*Syn.*, Narbonne, Bourdin.]—Size, large; colour, reddish next the sun, greenish-white in the shade; form, irregularly roundish; leaves, slightly toothed; flowers, small; glands, globular; pulp, white, very red at the stone; flavour, good; free-stone; ripens about the beginning of September; tree, healthy, an excellent bearer, but requires to be wrought upon the pear plum

stock, and will hardly take on the muscle stock. There has been much confusion in regard to this peach, the Teton de Venus, and the Royal. That there is some resemblance none will doubt, but that they are sufficiently distinct is admitted by the very best pomologists. Forsyth says that it will ripen its fruit upon standards.

6. Double Montagne. [*Syn.*, Sion, Montaubon, Montagne.] — Size, medium; colour, blush, marbled with a darker colour next the sun, greenish-white on the side next the wall; flowers, large; leaves, doubly toothed, destitute of glands; form, roundish; pulp, white all through; flavour, excellent; tree, healthy, and a good bearer. This will not take on the muscle stock, and is one of our very best forcing sorts; ripens about the middle of August.

7. Malta. [*Syn.*, Belle de Paris, Pêche Malte, Pêche de Malte, Italian Peach, Malte de Normandie.]—Size, medium; colour, greenish-yellow, marked with broken blotches of dull purplish red; flowers, large; leaves, doubly toothed; pulp, yellowish green, slightly red at the stone; flavour, extremely agreeable; free-stone; ripens about the end of August; tree, hardy, and a good bearer, keeps longer after ripe, and bears carriage better, than any other peach of the free-stone section. It ripens its fruit in general seasons in Normandy as an open standard.

8. Noblesse. [*Syn.*, Mellish's Favourite, Vanguard.]—Size, large, when there are not too many left on the tree; colour, pale yellowish green throughout, marked with very delicate red streaks and blotches on the side next the sun, altogether a pale peach; leaves, deeply sawed; flowers, large, destitute of glands on the footstalk or leaves; form, roundish oblong; pulp, yellowish, slightly tinged with red towards the stone; flavour, excellent; ripens about the end of August. We have, on the authority of Mr. Thompson, given the Vanguard as a synonyme of this peach, which, if it be not the same, we have long thought so similar in all respects as to consider them not worth cultivating in the same garden as distinct sorts. However, in this case of misnomer, luckily no evil can arise, as they are so much alike, and both so excellent, as to have our preference to almost any other peach. Mr. Lindley differs with us in this respect; he says, "This is one of our very best hardy peaches, and, perhaps, one of the most common; but it is often confounded with another, well-known, the Vanguard, which is somewhat similar in appearance and in its general characters. It is, however, distinguished by its fruit being, for the most part, oblong, narrowed, and plump at the apex, with a pointed nipple; in the Vanguard the fruit is equally large, or even more so, always globular, rather than oblong, and its crown or apex flat and often depressed. Nurserymen need not be at any loss to distinguish the two sorts when maiden plants in the nursery, the lateral shoots of the Noblesse being nearly as long as the main leader, those of the Vanguard being less numerous, and exceeded considerably by the main shoot; besides, the plants of the Vanguard are of a taller growth than those of the Noblesse. Indeed, so obvious and invariable have I found these characters, that should the two kinds become" continues this high authority, "inadvertently intermixed in the nursery rows, the most inexperienced foreman would be enabled to separate them, without any fear of mistake." The Noblesse takes best on the muscle stock, and is not only the hardiest, healthiest, and most useful peach, but, as Rogers justly observes, if only three trees were wanted for a small garden, this should be one of them.

9. Barrington. [*Syn.*, Buckingham Mignonne.]—Size, large; colour, deep red next the sun, yellowish green in the shade; form, roundish, with a deep furrow or suture; leaves, slightly sawed; flowers, pale and large; glands, globular; pulp, yellowish; free-stone; flavour, excellent; ripens about the middle of September; tree, healthy, moderate in growth, a good bearer, and well worth cultivation. It does not take readily on the muscle, but freely on the pear plum stock.

10. Grosse Mignonne. [This may be called the Peach of a hundred names. *Syn.*, French Mignonne, Vineuse, Large French Mignonne, Grimwood's Royal George, Grimwood's New Royal George, Mignonne, Veloutée de Merlet, Early Vineyard, Kensington, Royal Kensington, Marlborough, Veloutée, Swiss Mignonne, Avant, Early Purple Avant, Purple Avant, Purple Hative (of some), Pourprée Hative (of some), Pourprée de Normandie, Early French, Padley's Early Purple, Neil's Early Purple, Johnson's Early Purple, Johnson's Purple Avant, Transparent, Vineuse de Fromentin, Superb Royal, Belle Bausse, Belle Beauté, Royal Sovereign, Ronald's Early Galande, Foster's Early, Foster's, with several other names used in the continental gardens.—This excellent French peach was introduced by the Hon. Mr. Capel, to Kew, about one hundred and sixty years ago. It would be difficult to trace to their proper origin one half of the names under which it has been sold. Rogers informs us that the names Royal Sovereign and Superb Royal originated with Shailer, who succeeded Grimwood in the Chelsea Nursery; Grimwood's Royal George, Grimwood's New Royal George, and Kensington, were given by Grimwood himself, then proprietor of the Kensington Nursery, by which, as Lindley justly remarks, he derived a profit beyond what he would have done had he sold them under what he knew to be their proper name; and Forsyth himself admits, in his "Treatise on Fruit Trees," 4th edition, p. 31, that he gave it the name of the Royal Kensington, that it might not be confounded with Mr. Grimwood's Kensington peach, upon no higher authority than that he found it mentioned in the catalogue of the royal gardens at Kensington, in 1784, when he received his appointment as royal gardener, as a new peach from France. The names of Neil and Padley have been attached to it for no other reason than that a Mr. Neil sold Mr. Padley two plants of it at five guineas a plant. It is to be lamented that so much of this species of fraud —for it can be called by no milder term—has been practised, and hence the great confusion in the names of fruits.]—Size, large; colour, deep red next the sun, thickly mottled on a yellowish ground on the shaded side; flowers, large; leaves, crenated; glands, globular; pulp, palish yellow, reddish towards the stone; stone, small, parting freely from the pulp; ripens about the beginning of September. The pear or Brompton stock is the most proper for this fine peach, which is certainly the best in cultivation. It forces well, and ripens and thrives as a wall tree in the southern parts of England, but requires to be planted on a dry bottom.

11. Late Admirable. [*Syn.*, Royal, La Royale, Bourdine, Boudine, Boudin, Narbonne, Teton de Vénus, Belle Bausse (of some authors). Such are the synonymes given by Mr. Thompson, as furnished by him for the Encyclopedia of Gardening. We have elsewhere described the Bourdine without referring it to our present subject, as we have some doubts as to the propriety of making them the same. We will quote Rogers's description of the

Late Admirable, who considers it very distinct from the Bourdine, or Teton de Vénus, and wonders that any one acquainted with the three fruits could consider them the same. "The leaves of the Late Admirable," he says, "are large and slightly saw-like on the edges; flower, small; fruit, the largest of the season, except the Pavie de Pompone (which, by the by, is not worth cultivating), nearly round, with a deep furrow and beak, like the Teton de Vénus. The colour is a marble red nearly all over; pulp, white, melting, and separates from the stone, which is very red; juice, plentiful, and of rich flavour. The tree is a vigorous grower, and requires much care to get the young wood well ripened, as well as an ample space of wall or trellis. It takes freely on the muscle stock." Mr. G. Lindley also considered this peach as distinct from the Teton de Vénus and Bourdine, and observes, "M. Butret, a French writer, it seems, has been alluded to as authority for considering this peach, the Bourdine, and Teton de Vénus as absolutely one and the same fruit, declaring the pretended differences between them to be only '*un charlatanisme des pepinieristes.*' If by this he means to allude to his own countrymen," he continues, "I have nothing farther to say than that an illiberal idea does not usually arise in a liberal mind." Mr. Lindley recommends trying to propagate any two or three sorts of peaches, which they may consider alike, upon the muscle stock, and ascertain the result before they declare them to be absolutely one and the same fruit.

12. Red Nutmeg. [*Syn.*, Avant Pêche rouge, Nutmeg, Brown Nutmeg, Early Red Nutmeg, Avant Pêche de Troyes, Red Avant.]—Size, small; colour, bright vermilion, marbled with a deeper colour next the sun, pale yellowish next the wall; leaves, crenated and small; flowers, large; glands, kidney-shaped; pulp, yellowish-white, quite red at the stone; form, somewhat round; flavour, good; ripens about the end of July, hence is one of the earliest and hardiest peaches cultivated in this country, well calculated for the colder parts of Scotland. It should be eaten before over-ripe, else it becomes dry and unpleasant. A very old inhabitant of our gardens, and mentioned by Parkinson.

13. Red Magdalen of Miller. [*Syn.*, Madeleine de Courson, Madeleine Rouge, Rouge Paysanne, but not the Red Magdalen of Aiton's Epitome, or G. Lindley, in *Horticultural Transactions*, vol. v. p. 542.]—Size, below medium; colour, fine red next to the sun, pale yellowish next the wall; leaves, doubly sawed; flowers, large, pale blush; glands, none; pulp, quite white, reddish next the stone; flavour, good; free-stone; ripens about the latter end of August, or the beginning of September; an excellent, hardy, and early peach, and ought to be found in every collection, particularly in late situations. In stony soils and shaded places it is very apt to become attacked by mildew. Rogers says, an east aspect is most suitable for this peach, though Miller says this exposure is more liable to mildew than any other, and so it may be in damp or low situations; but much depends on the soil and season. It is not a very good fruit to force.

14. Petite Mignonne. [*Syn.*, Mignonette, Early Mignonne, Double de Troyes, Pêche de Troyes, Small Mignonne]—Size, below medium; form, nearly round; flowers, small; leaves, crenated; glands, kidney-shaped; pulp, white, red towards the stone; colour, fine red where exposed to the sun, yellowish white next the wall; flavour, good; ripens about the end of August.

15. Purple Alberge. [*Syn.*, Red Alberg, Alberge jaune, Pêche jaune, Golden

Mignonne, Golden-fleshed.]—Size, medium; colour, deep red or purple where exposed to the sun, yellow where shaded; leaves, crenated; glands, globose; flowers, small, and bright crimson; pulp, deep yellow, red next the stone flavour, good; free-stone; ripens the beginning of September. Mr. Rogers considers this as only a second-rate peach, and also makes the Yellow Alberge different from it. "The tree," he says, "is a second-rate, healthy, and a good bearer; and the fruit, from their peculiar colour, form a fine contrast with other peaches in the dessert." The muscle plum is the proper stock for this sort. Mr. Lindley recommends it for its hardiness, and states that it has ripened its fruit in Mr. Kirk's garden at Brompton, as an open standard.

16. Early Anne. [*Syn.*, Anne, White Avant.]—Size, small; form, globular; flowers, large, very pale-coloured; leaves, doubly sawed; glands, none; colour, nearly white, sometimes tinged with a few dashes of red on the side next the sun; pulp, white throughout; flavour, good, rather mealy; ripens about the middle of August, which is its greatest merit; takes best on the muscle plum stock; tree, tender, but a good bearer. Supposed to be of English origin, and to have originated with a Mrs. Anne Dunch, in Berkshire, during the reign of George I.

17. White Magdalen. [*Syn.*, Montagne Blanch, Madeleine Blanche.]—Size, medium; colour, dull white, marbled with red next the sun; leaves, deeply sawed; flowers, large; glands, none; form, nearly globular; pulp, white, slightly red next the stone; flavour, good; tree, healthy, although not a vigorous grower; an abundant bearer, requiring to be judiciously thinned, else the tree becomes soon exhausted. It is well calculated for forcing, and is a free-stone.

18. White Nutmeg. [*Syn.*, Avant Pêche Blanche.]—Size, small, indeed the smallest of all peaches; colour, white, sometimes tinged with red when fully exposed to the sun; flower, large, very pale; glands, none; leaves, doubly sawed; pulp, white throughout; flavour, very sweet; free-stone; ripens the middle of July; tree, delicate, but a good bearer, although seldom seen in British collections. Its earliness demands for it a place in every extensive garden, and we would recommend it as one of the best peaches for forcing in pits upon the Dutch principle.

19. Hemskirk.—Size, rather below the medium; colour, yellowish green, with many scarlet dots on the shaded side, bright red, shaded with a darker colour, on the side most exposed to the sun; flowers, large, pale rose; glands, none; leaves, doubly sawed; pulp, greenish yellow throughout; stone, small, nearly round, and much smoother than in any other peach; flavour, good; free-stone; ripens about the beginning of September. This excellent peach appears to be but little cultivated, notwithstanding its great merits, and also having been in our gardens since the time of Langley, who describes it as a "most beautiful and delicious fruit, and also a great bearer." What Lindley means in his "Guide to the Orchard, &c.," by its being from the royal gardens at Kensington some years ago, we do not comprehend, for he quotes Langley, not only as authority, but also as having figured it in his Pomona.

20. Lord Falconbridge's Mignonne.—Size, above medium; colour, dull red, with broad patches of a darker colour next the sun, pale yellow next the wall; flower, small; leaves, doubly sawed; glands, none; pulp, yellowish white, but turning reddish towards the stone; flavour, good; ripens about the middle of Sep-

tember; tree, hardy, a good bearer, and fit either for the forcing-house or south wall. Not so much in cultivation as it deserves, nevertheless, it has been in our gardens since the time of Hanbury. Mr. Lindley, in describing this peach, says that it was very plentiful in some parts of Yorkshire about fifty years ago, but he questions if it ever found its way into the London nurseries, a circumstance not easy accounted for.

21. Royal Charlotte. [*Syn.*, Kew Early Purple, Kew Royal Charlotte, Madeleine Rouge tardive, Madeleine à petites fleurs, Lord Nelson's.]—Size, above medium; colour, deep red on the sunny side, palish white on the shaded side; flowers, medium size, dark red; glands, none; leaves, doubly toothed; pulp, whitish, turning pale red towards the stone; flavour, exceedingly good; free-stone; ripens about the beginning of September. There is the Old Royal Charlotte, a very old variety, which is very different from this sort, and is withal not so good a peach.

22. Royal George. [*Syn.*, Millet's Mignonne, Locker's Mignonne, Early Royal George, Red Magdalene (of some), Madeleine Rouge à petites fleurs.]—Size, largish; colour, deep red, marbled with a still deeper colour where much exposed to the sun, very pale and sprinkled with many bright red spots on the shaded side; flowers, small; glands, none; leaves, doubly sawed; pulp, yellowish white, turning red towards the stone; flavour, excellent; ripens about the beginning of September; tree, healthy, and an excellent bearer. There is great confusion at present in regard to this peach, as there are several other Royal Georges in cultivation, but fortunately they are all very excellent sorts, three of which we will endeavour to describe. It is somewhat singular that Langley, in his Pomona, should not mention a peach under the name of Royal George, as he wrote in 1729, while Switzer, writing in 1718, should; at all events the varieties of Royal Georges can only be set down as having their origin since the accession of the royal family of Hanover. Mr. Lindley adds to his description of this peach: "There is very little doubt but that this is the Royal George of both Hitt and Miller, although evidently not the Royal George of Switzer, and may, therefore, be considered as the original Royal George." "When this sort was introduced," says Rogers, "is uncertain; but it is mentioned by Powell, who was gardener to George I. and Queen Caroline, at Richmond Lodge." The same authority further observes, "There is difficulty sometimes found in propagating the true Royal George on any of the three common stocks: those buds which chance to take on the muscle stock make the best tree, and should always be prefered." Under the name of Millet's Mignonne, one of our synonymes of this peach, we find the following information in Rogers's Fruit Cultivator upon the subject of forcing peaches in pots, a practice we were not previously aware had been common at so early a period, although mentioned by Abercrombie in his writings. "It is a prolific bearer," he says, "and takes well on the muscle stock; forces well in pots or otherwise, as was most successfully done by Mr. Brown, gardener to the late Lord Cremorne, at Chelsea, who kept all his trees in tubs or boxes, like orange trees, for years, and supported in such confined situations chiefly by the use of manured water. Horse-droppings, and a little soot, were the only substances employed to enrich the liquid. Mr. Brown's favourite sorts for forcing and growing in this manner were the French Mignonne, Early Admirable, Millet's Mignonne, Violet Hative, and for later fruit, the Bellegarde or Galland. The Noblesse he considered too

large for his mode of forcing." Mr. Rogers himself was a successful cultivator of peaches in tubs or boxes, and informs us that he potted his trees early in autumn, and afterwards plunged them in dry soil to stand the winter; being also in a sheltered situation, these trees produce fair crops, which ripened eight days sooner than on the walls. The kinds that did best under this treatment were the Violet Hative, Millet's Mignonne, and Montaban. The same authority makes also the following judicious remarks: "Miller complains of its being an indifferent bearer, but ascribes this defect to the right cause, viz., too deep planting on heavy soils, hence luxuriance of growth and too much pruning. If moderate growth be induced by a dry soil and shallow planting, the summer shoots may be thoroughly ripened, in which case there need be no fear of barrenness."

23. The Royal George Mignonne.—Whoever will compare the description of this fruit with the last in Mr. Lindley's "Guide to the Orchard, &c.," must admit that the shade of difference, if any, is exceedingly fine drawn.

24. Smooth-leaved Royal George.—Size, above medium; colour, beautiful red on the side next the sun, yellowish white, sprinkled with many very small red dots, on the side more shaded: flowers, large, deep rose colour; leaves, crenated; glands, globular—the three latter characters evidently stamp it distinct from the Royal George, No. 22; pulp, yellowish white, deeply stained with red near the stone; flavour, excellent; ripens about the middle of September. Mr. G. Lindley very justly remarks, that "this is not only one of the handsomest, but one of the best peaches in our collections, not excepting the Bellegarde, and cannot be too extensively known. The name appears to have originated with the late Mr. Lee, of Hammersmith."

25. Old Newington. Size, large; colour, beautiful red, marked with dashes of a darker colour on the side next the sun, yellowish white where shaded; flowers, large; glands, none; leaves, doubly toothed; pulp, yellowish white, very red at the stone; ripens about the middle or end of September; flavour, excellent; cling-stone. This is one of our oldest peaches, being mentioned by Parkinson, and by almost every succeeding pomological writer. It is one of three peaches recommended by Rogers for a small garden, viz., the French Mignonne, Noblesse, and Old Newington.

26. Smith's Newington. [*Syn.*, Early Newington, Smith's Early Newington.]—Fruit, medium; colour, red, with purple dashes on the the sunny side, straw colour where most shaded; flowers, large, pale rose; glands, none; leaves, doubly sawed; pulp, pale yellow, lightish red next the stone; ripens about the beginning of September; cling-stone.

The following is Mr. Robert Thompson's estimate of the merits of the peaches forming the list furnished by him for Mr. Loudon, in the new edition of the Encyclopedia of Gardening. "In forming a collection of peach trees, say of twenty-four trees of the very best sort, and which will ripen their fruit in succession, the proportions may be, Early Anne, 1; Grosse Mignonne, 3; Royal George, 2; Double Montagne, 2; Noblesse, 2; Malta, 1; Royal Charlotte, 2; Bellegarde, 4; Barrington, 3; Late Admirable, 4. Should any of these not, however, agree with the soil and situation, or should more be required at any particular season, then the proportions may be varied, or some others introduced, such as the Acton Scott, Spring Grove, and Mountaineer, which may probably be found hardier." These latter three we have not included in our descriptive list, as our opinion of their merits is not so high as to induce us to give them a preference to many others of much longer standing. Mr. Thompson's estimate of the best forcing peaches is also given in the work last quoted, as follows:—The Bellegarde, Grosse Mignonne, Royal George, and Barrington, to which we would add the Noblesse and Royal Charlotte.

The hardiest peaches, and, therefore, the best suited for late and cold situations and climates, like the north of England and some parts of Scotland, are the Barrington, Malta, Bellegarde, Bourdine, Noblesse, Chancellor, Purple Alberge, and Royal Charlotte. The next section, as regards hardiness, in addition to these, are the Catharine, Grosse Mignonne, Late Admirable, Royal George, and Smith's Newington; and the tenderest of all, suited for open wall culture, are the Early Anne, Smooth-leaved Royal George, and Madeleine de Courson. Forsyth recommends for a small garden the following, viz., the Early Avant, Small Mignonne, Anne Peach, Royal George, Royal Kensington, Noblesse, Early Newington, Gallande's Early Purple, Chancellor, Nivette, Catharine, and the Late Newington.

Of the American peaches, which have been introduced of late years, little can be said in their favour as suited to this climate. Those most recommended are—

Braddick's American Cling-stone, described by Lindley as pretty good.

Braddick's American Free-stone, figured, but not described, in the "Transactions of the London Horticultural Society."

Washington Peach; said to be a valuable free-stone, ripening about the end of August.

Kennedy's Lemon Cling-stone; much in demand for preserves; shape, that of a large lemon; colour, beautiful orange and yellow, fine red towards the sun; fruit, very large, often twelve ounces in weight; ripens about the end of September. This singular peach might be worth a place in some extensive forcing establishment in Britain.

Morris's Red Free-stone, } are described as being both early peaches, ripening
Morris's White Free-stone, } about the middle of August.

Mammoth Peach: very large; free-stone; ripens about the end of September or beginning of October. This fruit is remarkable for two singular characters, viz., having two kernels in each stone, and producing the same kind of fruit from the stone.

Blood Cling-stone; esteemed for preserving, on account of its singular blood-red colour, both outside and inside; riepns in October, and is of a large size.

Hoffman's Peach; another very large fruit, often fourteen ounces in weight, said to have been discovered by accident in a meadow near New York.

New York White Cling-stone; of ordinary size, ripening about the end of August or beginning of September.

Brevoort's Seedling, or Pound Peach; originated from a seed of the Hoffman's Peach, and differs little from it unless in ripening rather earlier, a very suspicious mark of distinction, as so much depends on the circumstances the trees may be placed in. This peach has found its way into our English nurseries, under the name of Morrisania, and is described by Mr. Thompson as large, round, greenish yellow and dull red, ripening about the middle of September; flesh, greenish white, and very good.

George the Fourth; another American peach, now cultivated in the British gardens. It has been described in the "Horticultural Society's Transactions," and in Lindley's "Guide to the Orchard, &c.," and is figured in the Pomological Magazine, table 105. Lindley's description of it is as follows:—"Leaves, large, acutely crenate, with globose glands; flowers, small, dull red; fruit, middle sized, globular, [the Americans describe it as very large, often nine or ten ounces in weight], deeply lobed at the summit, with a deep cavity for the footstalk, projecting more on one side of the suture than on the other; skin, moderately downy, of a uniform dark red next the sun, and of a fine pale yellow on the shaded part, mottled with bright red at the junction of the two colours; flesh, pale yellow, rayed with red at the stone, from which it parts freely; stone, very small, bluntly oval, not particularly rugged; flavour, good, when upon an open wall, excellent when forced."

Unique Peach; the leaves are very deeply and doubly sawed, ripens early; fruit, singular; originated in the woods of New Jersey.

Early Sweet Water Peach; said to have been one of the best American peaches; ripens about the end of July or beginning of August; was raised from a stone of the White Nutmeg peach, which it surpasses in flavour, and is twice the size.

Dr. Graham's White Free-stone Peach. Fruit, very large, perfectly white; stone, small; ripens about the middle of September; flavour, excellent.

Aster's Seedling Peach; somewhat like the Washington, and ripens about the same time.

Pine-apple Cling-stone; somewhat similar to the Lemon Cling-stone in colour and flavour, but roundish in shape, ripens later; flavour, somewhat like that of the Pine-apple.

Hoytes' Lemon Cling-stone; supposed to have been raised from a seed of the last by Mr. Hoytes, of New York; very large, often weighing twelve ounces; will not ripen in the open air of England.

Lady Anne Stewart's Peach. Fruit, about the medium size: ripens in September; colour, white, with a slightly bluish tinge.

New York Early Lemon Cling-stone. Fruit, large, from nine to twelve ounces in weight.

President; recommended by Lindley as a peach of great merit, ripening late, and therefore requiring to be planted in the warmest situations.

Brevoort's Seedling; somewhat resembling the Pound, or Hoffman's peach, also raised by Mr. Brevoort, but ripens earlier.

To these we may add the Flat Peach of China, or Java Peach, which was introduced some years ago by Mr. Kirk, of Brompton, but which can only be considered in the light of a curiosity, rather than in that of a useful fruit, although the late Thomas Andrew Knight considered that from the early habits of the tree it would become an acquisition. The same learned physiologist remarks, that he has observed the same excitability to be hereditary in the seedling offspring of the plants, and conjectures that there will be no difficulty in obtaining from the flat peach other varieties of similar habits, free from the deformity which has recommended it to the Chinese. Its natural habit is that of a slender-growing nearly evergreen tree. The fruit is flattened both at the apex and the stalk, and in form somewhat resembles the medlar. The introduction of this curious fruit from China seems to prove that the Peach, if not indigenous to that vast empire (which we think it is), must have been cultivated by that people for an unknown length of time.

The peaches that are most esteemed, which have originated in Britain, are the—

Almond Peach; raised by Mr. Knight, of Downton Castle, from a seed of the sweet almond, the blossom of which had been impregnated by the blossom of a peach, prior to 1817.

Early Downton; also raised by Mr. Knight, prior to 1815.

New Noblesse; said, upon the authority of the late Mr. Ronalds, of Brentford, to have been raised from seeds by a friend of his, but when or how is not stated.

Sulhamstead; raised in the garden of Mrs. Thoytes, of Sulhamstead House, near Reading, prior to 1819.

Acton Scott; raised by Mr. Knight from the Noblesse, impregnated by the Red Nutmeg, prior to 1814.

Barrington; raised by a Mr. Barrington, of Burwood, Surrey, above forty years ago.

Hemskirk; prior to the time of Langley.

Spring Grove; raised by Mr. Knight, from Niel's Early Purple, impregnated with the Red Nutmeg.

Old Newington. This is evidently of English origin; but how or when it originated there is no certain account. It is equally admired in France as in England, and has obtained from the French gardeners the name of *La bonne d'Angleterre.*

Smith's Early Newington; is ascertained to have been raised from a seed of the Old Newington, but by whom or at what period is not recorded.

Catherine; also raised in this country before the beginning of the last century, but by whom or where is not now known.

Peaches are usually divided into two kinds or sections, namely, French and English peaches, but to these we may add a third, viz., American peaches. That the latter kinds will ever become as common as the other two is extremely doubtful. "The kinds called French," as Rogers observes, "are dearer than those denominated English peaches; the reason is, that their stocks are not only dearer, but there is much uncertainty in making 'a good hit' of them by budding. Consequently some of them—as the French Mignonne and Gallande, two of the best—are often very scarce. Were there as much difficulty in propagating English peaches, maiden plants one year from the bud would be worth three times the sum now charged for them."

PROPAGATION OF THE PEACH.

The Peach is propagated by seeds when the object is to obtain new or improved varieties, but in this, as in all other similar cases, careful artificial impregnation of two distinct blossoms should take place, else the chance of success will be but small. It is, however, in general multiplied by budding, to continue known or approved varieties, and may be grafted and inarched for particular purposes. As we have already observed, the practice of raising this tree from seed prevails to any extent only in America. The late Thomas Andrew Knight, Esq., propagated many in this country by the same means, selecting dwarf trees, which he planted in large pots, and in properly prepared soil, by which means he obtained vigorous trees, and properly organized blossoms. He impregnated the pistils of the blossom of one of each sort with the pollen of another, leaving only three fruits on each tree to attain maturity. By this means he obtained some of his finest varieties. Besides having in view the production of rare or improved varieties of the Peach, Mr. Knight also entertained the idea, along with many others, that peaches originated from seed ripened in this country would produce a harder progeny than their parents; for, impressed with this idea, he writes, "I entertain little doubt that the peach tree might, in successive generations, be so far hardened and naturalized to the climate of England and Ireland, as to succeed well as a standard in favourable situations." The Peach does not, like many other species of fruit, much exercise the patience of the gardener who raises it from seed, for it may always be made to bear when it is three years old. "I will not," he continues, "venture to decide whether it might not possibly produce fruit even at the end of a single year. In prosecuting such experiments, I would recommend the seedling peach tree to be retained in pots, and buds from them only to be inserted in older trees, for their rapid and luxuriant growth is extremely troublesome on the wall, and pruning is death to them." For obtaining new varieties, the stone should be planted in autumn in drills two or three inches deep, and in the spring following they will come up; and after having one summer's growth they should, in autumn or spring following, be transplanted in rows in the nursery. In a year or two after they may be planted against the wall or pales where they are to remain to produce their fruit.

Grafting.—Grafting is rarely practised in this country upon the peach or nectarine. Cameron, a scientific gardener, and correspondent of the *Gardener's Magazine*, sows the kernels of peaches, nectarines, and apricots at the bottom of the wall where the trees are intended to remain, and either buds them in the August of the same year or grafts them in the March of the year following. He, however, prefers grafting, and finds the operation most successful when the scion has a quarter of an inch of two-year-old wood at its lower extremity. Trees thus raised bear the second year from the graft, and the fruit is of a superior flavour to that produced by trees budded on plum stocks. When budding is employed, the point of the shoot produced by the bud is pinched off after it has grown six or eight inches in length, and only five buds are allowed to push: the five shoots produced by these buds are shortened with the finger and thumb to five or six inches in length, and these being disbudded, so as to admit of only two shoots from each, a complete fan-shaped tree is produced in one season. The Flemish gardeners often graft the Peach, and prefer as a stock the Mirabelle Plum.

Budding.—This is the mode of increase in general use, and is performed in July or August: some perform the operation in June, but when budded too early the buds are apt to shoot the same year, which shoots, being weakly, are either killed in winter, or if they escape the frost they never make much progress; therefore, from about the middle of July to the middle of August, or rather later, is the proper time: the buds will then remain dormant till spring, when they will shoot forth with vigour. In performing this operation, as, in the case of peaches and nectarines, it is intended to model them into wall trees, the bud is set in the side of the stock, inserting only one in each near the bottom when the intention is to form dwarf trees, and at the height of three, four, or five feet for riders. Buds so planted will make shoots three or four feet in length the first season, whether the trees remain in the nursery or be at once planted out where they are to remain. These first shoots must be headed down either in June the same year, to gain a season, or in spring following, to four or five eyes, to cause them to send out a sufficient number of branches to form the future tree. Buds of peaches and nectarines may be inserted in old and bearing trees, as well as into young stocks, and also into the young branches of bearing apricots, by which means a great variety of these fruits may be proved or cultivated even in a small garden. In the old gardens at Dalkeith Palace, now pulling down, we find many peaches so treated, and it is amongst our earliest recollections to have seen peaches and nectarines both growing upon an apricot tree at Abercarney.

STOCKS FOR PEACHES AND NECTARINES.— The stocks used for this purpose are the Damson Plum, the Muscle Plum, Mirabelle Plum, Bullace Plum, and various other plums, either raised from seeds or increased by layers on purpose. They are also budded on stocks of seedling peaches, nectarines, and almonds, and upon apricots, principally the Moorpark. Our worthy predecessor, Mr. M'Donald, perhaps the oldest gardener in Scotland, lately pointed out to us some peach trees in the Dalkeith gardens wrought upon the common sloe. They appear to come early into fruit, and do not, as might be expected, make much wood.

Although the peach and nectarine take freely upon all the above stocks, still they are apt to gum on some, and to be of short duration in the case of others. This arises no doubt from a variety of causes, such as some stocks being more suitable for certain kindsof peaches and nectarines than others, also because some stocks are better suited for some soils than others. Abercrombie prefers the free plum stock, that is, stocks originated by sowing the stones of plums, and says, that they produce the most hardy, durable, and healthy trees; "though it is remarkable," he adds, "one sort of plum stock in particular is generally preferable to all the others on which to work peaches, as producing the most prosperous trees and improving the fruit, which is that of the muscle plum, if raised genuine, not from the stones, for it has been observed that seedlings run into many varieties, very different from the original." He recommends that they be raised from suckers or layers of the true muscle plum tree, or from the roots of such old peach, nectarine, apricot, or plum trees, as were worked upon muscle plum stocks.

It is not unusual to double-work some of the finer peaches and nectarines, with the view of improving the flavour and productiveness of the fruit. This opinion is held as orthodox by some, while others treat it as wholly erroneous. The operation consists in first budding in the common way, by inserting buds of any strong-shooting peach, nectarine, almond, or apricot into a plum stock; the buds shooting out strongly next summer, then upon the main shoot from the bud perform the second operation, by inserting buds of the approved sort intended for cultivation, suffering the shoots of the second budding only to shoot up and to form the tree.

The muscle plum and pear plum are the sorts preferred by the late Mr. G. Lindley. "These are the stocks," says this author, "on which we can place a firm reliance for the production of sound trees; the others ought to be banished from every nursery in the kingdom." The Brompton stock is strongly objected to by Mr. Lindley, who says that thousands of peaches and nectarines have been budded upon it, to the serious injury of every one who has purchased them.

English peaches are usually wrought upon muscle plum stocks, while what are called French peaches, which constitute our finest sorts, are budded on the pear plum stock. According to Lindley, those wrought upon the pear plum stock are much less liable to be attacked by mildew, particularly those having glandular leaves. This, if really the case, deserves our attention, although we believe the mildew to arise more from want of pure air, and from damp and shaded situations, than from any effect the stock can have upon the tree.

Rogers, who has had long and extensive experience in regard to stocks, says, "Three kinds of stocks are necessary for the successful propagation of the peach, viz., the muscle plum, pear plum, and the Brompton stock. The muscle is the principal for what are called English peaches, whereas such as are called French peaches require the pear plum, or some similar stock. In this he agrees with Lindley, but differs widely from him in his opinion of the Brompton stock, which he considers valuable for both peaches and nectarines, although ill-adapted and unsuitable for apricots. In this opinion he is joined by the late Mr. Ronalds, of Brentford, who says, "that he has no reason to think that the Brompton stock will not bear as fine fruit and last as long as either the muscle plum or pear plum, if budded low for dwarfs."

The French gardeners use almond stocks where the soil is dry, and plum stocks where it is strong and wet; such also was the rule laid down by Dubreuil, a French author of some merit. The late Mr. Knight recommended the almond stock for the finer sorts of peaches and nectarines, as likely to prevent mildew.

SOIL.—Almost all gardeners agree in the necessity of having a good soil for peaches. Abercrombie recommended one composed of three parts of mellow unexhausted loam, and one part of drift sand, moderately enriched with vegetable mould or cooler dungs; Forsyth, a soil lighter than for pears or plums,—a light yellow loam is the best. Harrison prefers a stronger soil, one which is more adhesive,—and in such, certainly, if properly drained, and not too stiff, trees will continue not only longer productive, but also attain a very old age; whereas, in lighter soils they are of shorter duration. Much manure should be avoided, as having a tendency to produce disease in the tree. The depth of soil is very important to be attended to. In too deep soils the roots of trees have an inclination to extend themselves perpendicularly, and thus get beyond the depth to which the sun's rays penetrate, and perhaps supply a kind of nourishment not easily explained, whereas in shallower soils they take a horizontal direction, and enjoy the benefits of this warmth, and ripen both their fruit and young wood much earlier in the season than trees growing in a deep, highly manured, or retentive soil. The Peach requires to be upon a dry bottom, and that formed of alluvial gravel or primitive rock is the best; chalk is in many cases too damp; yellow binding gravel too highly impregnated with iron or other mineral matter; and artificial floors, if not carefully made, and so constructed that the water may not lodge upon them, liable to many objections; still, however, if properly constructed, they are the best substitute for a good natural bottom. Artificial floors are prepared by excavating the whole soil out of the border, and after arranging the bottom into a regular surface, falling from the wall to the walk, under which a proper drain should be placed, to carry off any superfluous water that might accumulate, the whole is covered with a layer of strong clay, mixed with coal ashes or gravel, that will bind in the hardest manner, wetted from time to time, if the weather be dry, and when well trodden and incorporated, rolled, until the surface becomes quite smooth and hard. When this floor is perfectly dry, the soil is laid over it to the required depth. Inferior cement, mixed with sand and lime, makes an excellent floor; or where expense is not spared, it may be covered with foot-tiles or hammer-dressed pavement.

In making a peach border, a great deal of new, that is, fresh, loamy soil, taken from the surface of an old pasture, should be used, and if it be of a rich mellow nature, dung is unnecessary, nay, even hurtful; but if the soil be rather poor, the addition of completely decomposed dung, or vegetable mould of tree leaves and other vegetable matter, must be advantageous. Also, in making new borders, they should be made from six to nine inches higher than they are intended to be when fully settled, and a border of twelve feet, which may be taken for the medium breadth, should slope at least one foot towards the walk.

Planting.—The proper season for planting peach or nectarine trees is from the beginning of October to the middle of November, and from the middle of February to the middle of March. In light dry soils, early autumn planting is to be preferred, and in cold, late, and damp soils, the spring will be found more advisable. Mild humid weather should be chosen, but not when it rains much, or when the soil is saturated with moisture.

Harrison prefers planting peaches in the latter end of October or beginning of November; "for," he says, "if the trees be planted then, they will in many cases have pushed forth some new roots before the commencement of severe weather, and will have partly established themselves before the moving of the sap in the spring following, which will greatly assist them in making young wood the ensuing summer, and they will be considerably more vigorous than if planting them had been deferred until spring; therefore, planting the trees at this season ought to be attended to, when it possibly can be done. If planting is to be performed in winter, always do it when the weather is mild, as a frosty air soon damages the tender fibres. But whenever the borders are of a heavy, wet soil, the planting must be deferred until spring. The reason for so doing is, that the roots will not strike so soon in such a soil, as in one lighter and more suitable for the trees, unless they be planted at the end of September, or very early in October, when they probably might strike root before winter. But if not planted as early as described, it very rarely happens that they will strike root until spring, consequently, the trees would have been much better to have remained in their previous situation until the time of their removal, at the end of March or early in April, for the removing them certainly gives them a check, and by the soil being of a cold and wet nature, instead of the roots being benefited, they are more frequently injured, and sometimes the tenderest fibres are rotted off; and in the spring, when their assistance is wanted to aid in the speedy establishment of the tree, those rotted fibres spread their injurious effects to other parts of the root, thus retarding instead of promoting its welfare."

Peaches and nectarines may be planted when of a large size, and after they have produced crops of fruit. This is, however, to be recommended in extraordinary cases only, such as filling up a vacancy in a wall, or in a peach-house, which may have been occasioned by accident or otherwise. Indeed, the Dutch and Flemish gardeners carry this matter so far that they annually take full-grown trees off their walls to fill their peach houses and pit with.

When planting is to be done with a view to cover a new wall, the young trees are to be preferred, that is, trees of from two, three, or four years training in the nursery. Some prefer to plant maiden plants, and where time is no consideration we should be of the same opinion, because the trees could then be trained or formed exactly as the planter pleased. Some, as Mr. Cameron, recommend sowing the stones or kernels at the bottom of the wall where the tree is intended to stand, and to bud it, as has been already explained.

On this subject Rogers offers the following opinion:—"In planting a collection of peaches, dwarfs and standards (that is, riders), let it be observed to have the dwarf and the rider over or next it of the same kind. This is convenient, because when the rider comes to be removed, or reduced, it is done without breaking the selection of sorts. Weakly and vigorous sorts should be placed alternately." In this latter opinion we disagree with this experienced planter, because, by planting weakly and vigorous sorts alternately, the stronger-growing kinds deprive the weaker of their due share of nourishment from the soil, by extending their roots beyond their proper limits, and also because their vigorous branches will in a few years encroach in a like manner upon their more feeble neighbours. We would rather plant the strong and vigorous kinds by themselves, and allow them greater space, and plant the less robust also by themselves, allowing them less space between each.

There is a great difference in the growth of some sorts of peaches from others, which is not always attributed to the real cause. The late Mr. Cobbett, although he is seldom quoted by gardening authors (perhaps because he was not himself one of the craft), has nevertheless made many shrewd and accurate remarks. On the subject now before us he says, "When gentlemen go to a nursery to choose trees, and especially trained trees, they are too apt to be captivated by the appearance of the plant; but as ill weeds grow apace, so it is with fruit trees. A Catherine or a Magdalen peach would be of twice the size in the same space of time as a French Mignonne or Montaubon; and, indeed, it may be laid down as a general rule, that, in proportion as the fruit excels, the stature of the tree is puny and its growth slow: it is the same through almost every thing in nature, and it would be strange indeed if peach trees formed an exception."

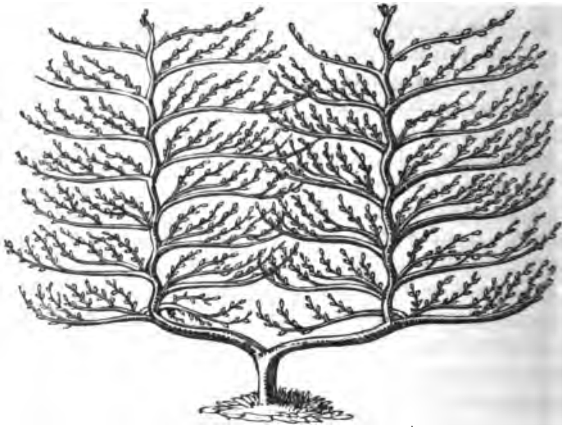
In regard to procuring young peach trees, or indeed any sort of fruit trees, it is the best and most economical to apply to a respectable nurseryman at once, and there are many who have made the study of fruit trees a particular branch of their profession. To such as do not employ regular gardeners this is important, and the better way will be to inform the nurseryman of the number of trees required, extent of wall, espalier, or quantity of ground to be planted, leaving him to form the selection, so as to suit the kinds to the circumstances of the place.

The period for procuring trees is as early in autumn as the leaves drop from them, because by so doing there will be the greater choice, as it is the invariable custom in such cases to make good the old saying, "first come first served." Nor is it necessary that the trees be taken up so early if any circumstance should occur to prevent their being immediately planted, but it is necessary that the selection be made, and the trees marked, which is usually done by attaching a parchment label, with the name of the purchaser written upon it; the trees may be afterwards taken up when the preparations are completed for their being planted.

It often happens in the best gardens that young trees will be required to fill up vacancies on walls already planted. In this case, never plant a young peach, or indeed any other tree, in the same place where one has been taken up, without excavating a large proportion of the soil and every fragment of root left in the ground, and replacing it with new or fresh soil, of a quality fitted for the purpose. In planting young trees in borders already settled, raise the new mould a few inches above the old level, else, from the sinking of the fresh disturbed soil, the young trees would become too low, and suffer greatly in consequence.

In planting, the greatest care should be taken not too plant too deep, for from this cause alone more trees are injured than by almost all other bad modes of planting put together. When the trees are ready for planting, open the ground so wide that not only the larger or main roots may be laid in at their fullest extent, but their fibres also, and when they are all spread out, and the broken ones cut smoothly across, the mould should be broken very fine and sprinkled regularly over them, a little water being given at the same time to wash it firmly into every crevice: when it is all filled in, tread it gently down with the foot, and mulch the surface over with rotten dung, to the depth of three inches, and as far around the stem as the roots extend. It will be necessary at the same time to fasten them to the wall, but not firmly; but so that the tree may be allowed to sink with the mould. It is of great importance that the roots be laid out horizontally, and not placed perpendicularly, because, in the former case, they will naturally extend themselves in that direction, and so keep near the surface, to receive benefit from the warmth of the sun's rays, and also within the reach of food proper for them; whereas, if planted perpendicularly, they will extend in that direction, and in a year or two reach the bottom of the prepared border, get beyond the genial influence of the sun, and into a cold, uncongenial medium, if not actually into a bad and pernicious subsoil; consequently, they will soon show evident signs of sickliness, unproductiveness, and decay.

The distance at which peaches and nectarines should be planted apart much depends on circumstances; of which the quality of the soil, height of the wall, mode of training to be adopted, and kind of peach or nectarine, are the principal. Hayward says, the peach tree, in well-watered borders, will occupy sixteen feet square of walling. Hill calculates that twelve feet square is as much as a dwarf peach or nectarine tree will annually cover with young bearing wood. Harrison lays it down as a rule to plant at twenty-one feet distance for a wall twelve feet high, and assigns the following reason for that distance:—"This distance," he says, "will allow the trees to grow for many years without requiring to prune back, in any considerable degree, the leading branches, which [he thinks] would be necessary if the trees were much nigher, in order to prevent the branches from intersecting one another, otherwise the trees would be injured thereby. Also, to shorten in any great measure the leading roots or branches, is very injurious, for such trees seldom prosper for many years after such a system is commenced."



Pruning and Training.—The Peach is almost universally trained in the fan form, although some have recommended considerable deviations from that manner. Pruning, therefore, to a certain extent, depends on the mode of training to be adopted or followed. Hitt was amongst the first to lay down systematic rules for training, and some approve of his methods even to this day. Since his time, however, a great variety of forms have been recommended, which, if brought together, would form a moderately sized volume. Upon this subject we will endeavour to compress, in as little space as a sufficiently clear definition will admit of, the essence of the most rational and approved modes, and will premise by stating that it has long been our individual opinion, that all pruning and training depend upon circumstances so various, that no specific or absolute rule can with safety be acted upon; for what might be excellent management in one garden, nay, on one tree in that garden, would be absolutely bad if applied to another existing under different circumstances.

Pruning commences upon peach and nectarine trees the season after the bud has been inserted, and consists in heading down the stock to a little above where the bud has been introduced. Some leave five or six inches of the stem of the stock above the bud, as they say, for fear of injuring it, and also to secure the young shoot to which issues from the bud, by training it to that part of the stock with a string of matting. Others, and we think with greater judgment, cut off the head of the stock close above where the bud was inserted. After this the whole strength of the plant will be thrown into the bud, and it will push out a strong shoot, which may be called the foundation of the future tree. All young shoots appearing upon the stock other than that from the inserted bud, must be displaced as soon as they appear, else they would rob the bud of its proper nourishment. The next operation of pruning takes place on trees intended for dwarfs the spring following, when the young shoot is cut back to four or five eyes or buds, each of which sends out a young shoot, which forms the future tree. Trees designed for half or full standards, or riders, and which were budded at the proper height, must also have the first shoot from the bud headed down, as above, to produce lateral branches, but those which were budded near the ground, and are intended for standards, are to have their first shoot left to its full length the first year, and when it has attained its proper height, which will in general be the first season, it is to be stopped, to cause it to throw out lateral shoots to form the future head. Sometimes, when buds break strong, they are pinched back or topped in June the first year, and these, if not attacked by insects or stinted from want of nourishment, will send out laterals which will ripen the same season, and by this means a season is gained in the growth of the tree. Such trees are called one-year cut-back Maiden dwarfs or one-year cut-back Maiden standards, as the case may be. Maiden plants are those of one year after working, and these are preferred by some for planting where they are to remain. We find Mr. Harrison to be of this opinion: he says, "The tree must be a maiden plant of the first year after being worked. The tree must be headed down at spring, so that six buds are left upon it. When the shoots have pushed, let them be regularly disposed in a fan-way, by securing them to the wall. During the summer lateral shoots will generally be produced upon those six which were trained in in spring; such shoots must be disposed of in the following manner. If the tree pushes very vigorously, train all side laterals, and rub or prune off the foreright ones; but if the tree be not very vigorous, only train in the two lowest lateral shoots, and about five inches farther along the shoot train in two more: thus proceed to train in laterals, and all the intermediate ones must be rubbed off. This regulation must take place when the shoots are about three inches long, and as they advance in growth during the summer, let them be regularly secured to the wall. At the following winter pruning the leading shoots must be shortened back about one quarter of their length, and the lateral ones about one half. Whatever lateral shoots are produced upon the leading shoots of the branches during the second summer, let them be treated as directed for similar shoots the last year." The great object to be kept in view in the regulation or formation of a young peach or nectarine tree to be trained against a wall or trellis is, to cut back each shoot so as to cause it to produce one, two, or three more, as may be required, and these so situated in regard to number and strength that the tree may be said to be equally balanced, that is, as nearly an equal number of branches as can be made to issue from both sides of the principal stem. If this be not attended to at the commencement of training, it will be exceedingly difficult ever after to make a handsome tree.

When the trees have attained a fruit-bearing state, the system of pruning to be pursued must be founded on the recollection that all the varieties of peaches and nectarines bear the fruit upon the young wood of a year old. The same shoot seldom bears after the first year, except on some casual small spurs; but these are not to be depended upon, and in all ordinary cases spurs are to be discouraged. There are, however, extraordinary circumstances which may arise to lead to the adoption of the spur system to a certain extent, and hence we find that the late Mr. Knight recommended for late and cold situations a sort of mixed mode of pruning, by which he had a produce both from spurs and young wood. "Instead of taking off a large portion of the young shoots, and training in a few only to a considerable length, as is usually done, and as he would do himself, to a great extent, in the vicinity of London, and in very favourable situations, I preserve," he says, "a large number of the young shoots, which are emitted in a proper direction in early spring by the yearling wood, shortening each, where necessary, by pinching off the minute succulent point generally to the length of one or two inches. Spurs which lie close to the wall are thus made, upon which numerous blossom buds form very early in the ensuing summer, and upon such, after unfavourable seasons, and in situations so high and cold that the peach tree in the most favourable seasons usually produced only a few feeble blossoms, I observed," he continues, "as strong and vigorous blossoms in the spring as I have usually seen in the best seasons and situations; and I am quite confident that if the peach trees in the gardens round the metropolis were pruned in the same manner as above directed, an abundant and vigorous blossom would have appeared in spring. I do not, however," he states, "mean to recommend to the gardener to trust wholly in any situation for his crop of fruit to the spurs produced from the above-mentioned mode of pruning and training the peach tree. In very warm and favourable situations, I would advise him to train the larger part of his young wood according to the ordinary method, and in cold and late situations only to adopt to a great extent the mode of management above suggested. A mixture of both modes in every situation will in general be found to multiply the chances of success, and, therefore, neither ought to be exclusively adopted or wholly rejected in any situation. The spurs must not be shortened in the winter nor spring till it can be ascertained what part of them are provided with leaf-buds."

We have quoted the above suggestion at length, because there are very many situations in Britain in which the Peach often fails, on account of uncongenial autumns, to ripen to full maturity the annual young wood. When such is the case, the succeeding flower-buds, being only immaturely formed, blossom too feebly to produce fruit, and not only is there a failure in the crop, but the foundation of disease is laid in the tree, from which it seldom recovers, and which each succeeding cold or wet autumn tends to increase. In cold and late situations, shallow, dry borders should be adopted, which will prevent the tree from shooting too vigorously, and producing large and succulent shoots, which are always the most difficult to ripen, whereas moderately strong and close-jointed wood would be produced, and these would, in the majority of seasons, become fully matured to their extremities. Conformable with this idea is the rational and very common practice of shortening the young wood at every annual pruning, and thus getting rid of the extremities of the shoots, which have often, even in good situations, not completed their growth when the frosts of autumn set in and suddenly check the ascent of the sap, thus leaving the extremities in a state fit for nothing but to perish. In strong, free-growing trees this is the more obvious, whereas in trees of less luxuriant growth the wood ceases to elongate much earlier in the season, and is thus more likely to be ripened before the frosts of autumn set in. Many suggestions have been offered to correct this defect in peach culture in the worst parts of our climate, for if we can only get well-ripened wood in autumn, there is seldom any fear of a plentiful supply of fruit following, besides insuring the health of the trees. Besides, the annual shortening of the young wood tends greatly to strengthen the tree, by preventing it from unnecessarily expending its accumulated sap by the production of more wood than is absolutely required.

On this subject Mr. Thompson justly remarks, in the *Encyclopedia of Gardening*, "That the peach tribe in the climate of Britain, in order to exist in vigour for any length of time in the open ground, [and he might have added, in peach-houses also,] must have their shoots shortened every winter. This, by increasing the power of the roots relatively to the branches, occasions vigorous shoots the following season; and thus the tree is kept in an active state; whereas if it were allowed to expend all the power of its accumulated sap every year, it would soon exhaust itself, and die of old age, as the standard peach trees do in a few years in the unpruned American orchards, and also in the orchards of Italy." Besides this, were peach trees left unshortened, they would soon become naked or destitute of bearing wood, both at their lower parts and also throughout the middle of the tree, the young wood forming at the extremities only.

Forsyth, upon this subject, remarks, "It is too common a practice to lay in the shoots at full length, taking off only the points of the branches, which generally after a few years leave the walls quite naked; whereas, if attention were paid to the training, especially for the first four years, you could always fill the wall with fine bearing wood from top to bottom, and the trees would produce a great deal more fruit and of much finer quality than when they are run up in the former way, for those trees are in general too weak to bear fruit.

It is also necessary in the case of luxuriant-growing young trees, when they send out extra strong shoots, which they often do, and which would run up three, four, or five feet, sending out only a few weakly laterals near their top, to pinch them off about the month of June, which will cause them to send out side shoots, which, if not laid in too close together, will ripen and make good bearing wood for the following year. Such shoots may often be pinched back twice in the course of one season, and will then send out much better wood than if left to grow undisturbed.

In shortening Peaches it is necessary to cut always at a wood-bud, and not at a fruit or blossom bud: these are readily distinguished from each other; the wood buds being long and pointed, and the fruit or blossom bud short and turgid. It often happens, particularly in bearing trees, that a wood bud is situated between two blossom buds: in such cases it is well to cut there. It would be worse than useless to cut at a blossom bud, or to shorten a shoot having only such buds, because no young shoot can be produced, and although upon wood so circumstanced there may be flowers produced and even fruit formed, still that fruit can never come to maturity for want of a leading shoot to draw nourishment to it. When it becomes necessary to cut for the production of young wood in parts of a tree thickly set with shoots crowded with blossom buds, by carefully examining them, most of them will be found to have very small wood-buds near their base, and if they are cut there, young wood will be produced.

It often also occurs that whole branches and even nearly entire trees will be found to have shoots with nothing but flower buds, excepting sometimes the terminating bud, which is often a wood bud: such shoots must be laid in at their full length, and should be carefully examined, to detect the nearest wood bud to cut at for the production of a supply of young wood, as all such shoots as the above must be entirely cut out at the winter pruning.

The Peach and Nectarine are usually pruned at different periods of the year; in other words, they receive what is technically called a summer and a winter pruning. But these are very indefinite terms; for the Peach, from the nature of its growth, may be said to require regulation during the whole period of its growing. The usual season of commencing summer pruning in this country is in May and June, when a general selection of proper shoots is made, and these are nailed into the wall or tied to the trellis as they advance in growth, for the purpose both of preserving them from the effects of high winds, and of affording them the benefit of warmth from the wall by shelter and the reflection of heat. Early in May this selection of shoots should be made, and here the whole art of peach pruning may be said to be concentrated. Such shoots only as are wanted to fill vacant spaces, and to furnish the tree in every part with fruit-bearing wood, should be retained, and not one more; for every one beyond what is absolutely required for these purposes has only the effect of crowding the tree with a superfluity, which will have to be cut out at a future period, and the nourishment which they abstract is thus so much taken from what ought to go for the benefit of the fruit and the maturation of the wood and buds for the succeeding season. We may safely assert that peach trees in general are much injured by too much wood being left on them; but to lay down any rule for the regulation of this matter would be impossible, so much depending upon the circumstances in which each individual tree may be placed. When the proper supply of young wood is determined upon, all other should be displaced. At this early season, this is done by what is called disbudding, which is performed by rubbing off all superfluous buds or shoots with the finger and thumb, or by cutting them out with a sharp-pointed knife. The sooner this operation is performed the better; and indeed, if it were practicable, as it is to a certain extent, to remove all superfluous buds even before they expand into leaf, it would be a vast saving of the accumulated sap of the tree.

The French gardeners are more attentive to this department of peach culture than we are. They pay great attention to disbudding in spring, and during summer they pinch off with their finger and thumb, before it becomes woody, every young shoot that they intend to remove, and which is usually left by British gardeners to be cut out afterwards with the knife. They even go so far in husbanding the sap, that they in many cases thin the blossom-buds before they expand, instead of allowing them to set their fruit and to be thinned afterwards. Not only are the trees much strengthened by this mode of management, but the labour of pruning is greatly diminished.

Harrison recommends two summer prunings or hand dressings, viz., "The first as soon as the shoots have got one inch and a half long, in doing which always leave all shoots that have fruit at their bases; but all those that have not fruit so situated must be rubbed off, except the lowest and uppermost shoots, which must always be left (with one exception, which he afterwards describes), whether they have fruit at their base or not. If the shoot of last year's wood be from six to fourteen inches in length, the lowest and uppermost must be left; and if there be no fruit at the bases of the intermediate shoots, they must all be rubbed off; but if it should exceed fourteen inches, in addition to the lowest and uppermost shoots, another must remain in the middle, although it should not have fruit at its base. If there be one (that has fruit at its base) situated near the place desired, such a one must be retained in preference to one that is destitute. When a shoot of the last year's wood is only five inches or less in length, and has no fruit upon it, only leave the lowest shoot, rubbing off all others; but if there be fruit upon it, the lowest shoot and those having fruit at their bases must be retained, and all others rubbed off, however they may be situated." After some intervening remarks, Mr. Harrison proceeds with the second regulation of the shoots, which takes place as soon as the fruit is stoned, and is to the following effect:—

"Upon those shoots of the last year's wood, which are from six to fourteen inches long, the lowest and uppermost new shoots must be trained to the wall; all the intermediate ones which were retained on account of having fruit at their bases, must now be shortened down, so as to leave three eyes remaining upon each. If those shoots had been shortened earlier than this time, the fruit at their bases would not have stoned so well, and a great many would have dropped off; but being left until the stoning is effected, they greatly assist in that operation, and by shortening the shoots after the fruit is stoned, the sap is diverted into it, and contributes to increase its size. Those shoots of the last year's wood which are upwards of fourteen inches in length must have (in addition to the lowest and uppermost shoots) another retained about the middle. Those shoots of the last year's wood which are only five inches or less in length, and that had only one shoot retained, must have it trained in, but such of them as had fruit upon them, and whose shoots were on that account retained at the first dressing, must have the lowest shoot trained in at full length, and the uppermost one must be pruned back so as to leave it about three inches long, and be trained to the wall; any intermediate ones must be cut down, so as to leave three eyes as before directed." We have made this quotation, because there is so much system in the mode of regulation, and would refer the reader to consult Mr. Harrison's book, in which much original and interesting information will be found.

Mr. G. Lindley, after premising that May is the season for disbudding, proceeds, "As soon as the young shoots have grown long enough, the leading one from each branch should be nailed neatly to the wall, selecting one or two of the side shoots produced lower down the branch, and training them parallel also. This applies to those of the stronger branches at and near the extremity of the tree. Those in the middle and near the bottom, will allow of but one shoot, probably, in addition to the leaders; this will depend upon the space left in the winter pruning; if sufficient, it is always better to have a young shoot on each side, as well as the leader, than to have only one, for it is by this arrangement that a succession of young wood can be kept up throughout every part of the tree. Should young shoots, indicating extraordinary vigour, any where make their appearance, they should immediately be cut out, unless where a vacant part of the wall can be filled up, because an excess of vigour in one part of the tree cannot be supported without detriment to the other. Peach trees, when in a state of health and vigour, generally throw out laterals from their stronger shoots: when this is the case, they should not be cut off close, but shortened to the last eye nearest the branch; and if there be room, one or two of those first produced may be nailed to the wall, or the middle shoot may be cut out, leaving the two lowest laterals, and allowing them to take its place; thus frequently obtaining two fruit-bearing branches, when the former one would, in all probability, have been wholly unproductive of fruit the following year."

Mr. Lindley, like ourselves, is decidedly against the slovenly practice of leaving more young wood on the trees than can be wanted for another year. With respect to the season for commencing what is called winter pruning, opinions are at variance, some considering autumn, some winter, and others spring as being the best time. Our own opinion has always been in favour of the latter period; but we will, notwithstanding, notice the opinions of others, premising, that a good deal depends upon whether the situation be early or late, and whether the season be severe or moderately temperate.

Forsyth and Rogers appear to prefer spring pruning. Lindley is silent on the subject. Harrison, "as early in the season as the trees will admit;" that is, early in autumn, and soon after the leaves have fallen, or in December and January. Hayward, as soon after the tree is divested of the fruit as possible, "for the earlier this is done, the better will the wounds heal, and the buds form themselves for the succeeding season." Abercrombie is less definite on the subject: he says, "The winter pruning may be executed any time from the fall of the leaf in November, until the beginning of March; for no weather has any particular effect with regard to proving injurious to the new-cut shoots, as sometimes imagined; this work should, however, never be delayed till late in spring, because the blossom buds will be so very turgid or swelled, that numbers of them will be unavoidably rubbed off in performing the operation of pruning and nailing, though some wait till this period that they may better judge of the good and bad buds, and of the wood buds from those that produce blossom and fruit. This is of some importance, but the sap is generally risen sufficiently in January, or sooner, to swell the buds to enable you to distinguish them."

We have already alluded to the utility of shortening the young wood at this time of pruning, and urged the necessity of arranging this young wood so that every part of the tree be alike well furnished with it; we will now proceed to speak of the various methods of training, quoting our authority, so that the merit or defects of each may rest with the respective authors; but before doing so, we will make one quotation more from Lindley's excellent work, *The Guide to the Orchard.* "One principal object in the management of the Peach must be, to keep up a constant succession of young wood in every part of the tree; for, unless this be accomplished, the crop of fruit will be partial and defective. To effect this, the annual shortening of the young wood is perfectly calculated; but the manner in which this ought to be performed has by no means been fixed upon one certain principle; the various methods laid down and insisted on by writers being greatly at variance with each other, they leave the inexperienced gardener in a dilemma as to which course he should pursue. Some of these are so barbarous and absurd, that it has always appeared to me an act of folly in any one making an attempt to follow them."

The sure method of obtaining a constant succession of young wood throughout every part of the tree, he justly observes, is to be effected by pruning alone. "Commencing with the winter pruning, the first rule to be laid down as a basis for all the rest is, to shorten every shoot in proportion to its strength, and to prune to where the wood is firm and well ripened; this will cause all the pithy and unripened wood to be removed, thence causing a supply of that which is better ripened for the ensuing year. But in order to give every facility to the ripening of this wood, it must be trained thin, not in profusion, according to the general custom, but such shoots only as may be required for the following year."

The following paragraph contains all that we consider necessary for the instruction of the merest tyro in peach-pruning, in addition to the rules we have laid down above:—"Trees which have arrived at a bearing state should have their strongest bearing shoots shortened to twelve or fourteen inches, those next in strength to eight or ten, and the weaker ones to four or six, pruning each to what is termed a triple eye, or that where there is a blossom bud on each side of a wood bud. Where branches are not in a bearing state, these triple eyes will not be found; they must therefore be pruned to a wood bud alone, which is always known by its sharp point."

The earlier gardeners almost universally trained the Peach in the ordinary fan form, and so do the majority of gardeners of the present day. Hitt, who was among the first to treat the subject of training upon a systematic principle, recommends a species of training by which the leading principal branches are brought to a horizontal position and made to diverge from two stems, which are trained perpendicularly and in a serpentine form. The young or bearing branches rise from the upper side of the horizontals, and are trained perpendicularly. Hitt had followers in his day, and some have continued his mode even to this time; we do not, however, approve of it, and judging from the specimens so trained as examples, in the garden of the London Horticultural Society, we are quite convinced of the inutility of the plan.

Forsyth recommended fan training, as do Abercrombie, Nicol, Harrison, &c., and Hayward has gone so far into the subject of training that we can only refer the reader to his work (*Science of Horticulture*), in which much curious reasoning and abundance of plates will be found. The only mode recommended by this author that we think entitled to the attention of the *profitable* peach grower, is what he terms the wavy or curvilinear method, and which he considers combines all the grand requisites to be obtained by training. This mode he describes as consisting of "two principal branches, through which the sap will flow in equal portions from the root, to the length of three feet, before it is permitted to form collaterals; the same effect will be produced as if the whole sap were to pass up the single stem of a standard of six feet; trees of which description, it is justly observed by Bradley, 'make fruit branches in such plenty, that hardly any barren shoots are to be found upon them.' The whole of the sap will, by this mode of training, be expended in profitable and increasing production, and the same square of walling will be furnished with more bearing wood in three years, than can possibly be done by any other mode, and than can be effected by the common mode of practice in less than eight or ten years."

The open fan mode appears to be of French origin, and is described by the late Professor Thouin, and is exemplified in the Jardin des Plantes, at Paris, as well as much practised by the gardeners of that country in the cultivation of the Peach. The late Mr. Knight also proposed a similar mode of training, which he thought would be applicable not only to the peach, nectarine, and apricot, but also to the pear, cherry, and plum tree.

Mozard and Sieulle, French gardeners of merit, furnished the deputation sent by the Caledonian Horticultural Society to examine into the state of gardening in France, Holland, and Belgium, soon after the last general peace, with much information. The essence of their practice is quoted in the *Ency. of Gard.*, from the "Horticultural Tour," from which we take the following.

Mozard's mode of training peach trees is as follows:—In the course of the winter he cuts over the young tree above the graft, leaving four or five buds, to produce as many branches. In July following, he cuts out, close to the main stem, all other branches than those absolutely needed for furnishing the tree. He trains regularly to the right and left; but the weaker branches receive less inclination, or are placed more upright than the stronger ones, that this more favourable position may give them energy, and bring them to an equality of vigour with the stronger branches, which are laid in horizontally. "This mode of arranging the strong and weak branches is held of much importance by the French gardeners, and it is to be wished that our brethren in Britain would direct their attention more generally to the same subject." At the first regular forming or cutting in, about a year and a half after planting, the branches are reduced to two on each side: and at the next pruning one branch is removed on each side, leaving the tree to be formed only of two principal branches, and those the most equally balanced as to form and promise. If the first year's growth do not yield two sufficiently good leading branches, they are sought from the growth of the second year: the best branch of the former year is now with this view trained upright as a stem, and two leading branches or arms are derived from it in the succeeding season. In subsequent years the pruning is conducted on similar principles. It is a common rule to leave two secondary arms, of nearly equal strength, and about two feet apart, on each side. In trees managed in the way now described, the sap seems to be equally distributed, at least, the trees exhibit upon the whole a great equality of branches, both as to size or strength, and as to furniture both of twigs, leaves, and fruit. Continued care is exercised to keep both sides of the tree equally balanced as to vigour. If one principal arm becomes stronger than the other, a few robbers are allowed to push for a time on the weak arm, with the view of drawing an increase of sap to that side of the tree, till the equilibrium be restored, or the weak arm is altogether raised a little more towards the vertical, while the stronger is depressed more to the horizontal, and thus an equality is gradually accomplished. The *lambourdes* or robbers, it may be added, with due management frequently afford the healthiest and best wood. They are cut down to a foot and a half, leaving one or two buds as near as possible to the trunk of the tree; the resulting shoots are laid in, and form good fruit-bearing wood the next season. The annual shoots are left of different length, according to the vigour of the tree, from one foot to three feet. There are two kinds of shoots; such as are the produce both of the early spring and of the summer flow of sap, and such as result from the latter only. The former are prefered, and are called *rameaux*,—the latter are distinguished as *ramilles*. When the trees reach the top of the wall, the cutting in is discontinued, and the pruning extends only to shortening the leading shoots, or in some cases bending them till they be confined about two or three inches below the coping of the wall. In this way an equable distribution of the sap in the central parts of the tree is promoted. In the regular course of pruning, all branchlets that show flower buds only, or are thought to contain no others, are sacrificed without mercy. This would appear absurd to any one not a horticulturist; but if such branchlets do exist, their excision is quite prudent; for wood-buds or shoots are like pumps to draw sap towards the branchlets; and if they be wanting, the blossom on the twig commonly fails to set, or the fruit from it soon falls off, or at all events is deficient in size and flavour. From four to eight flower buds are left on each twig, according to its strength, and a wood bud at the extremity, when it can be there had, or between two flower buds near the extremity. When this wood bud expands into a shoot, the shoot is shortened into an inch or so in length, and thus remains as the pump for drawing sap to the four or eight buds on the twig. Other wood shoots, as they are called, which may appear below the fruit buds, or nearer to the main branches, are cut down to one or two eyes."

Mozard's practice, if not applicable in every respect to the climate of Britain, contains, it must be admitted, much that the British cultivator would be benefited by adopting.

Sieulle's mode of managing the Peach during the first two years is different from that of Mozard's, last noticed. "The distinguishing characteristics of Sieulle's method, are applicable only to young peach trees in their first and second year. In the first year he does not at all cut or shorten the two original or principal branches, called the *mère* branches. The young tree has only to be fixed to the wall or trellis, requiring no other treatment till the fall of the leaf. By leaving these mère branches at full length,and only disbudding late in autumn, the vigour of the young tree," he thinks, "is greatly promoted. He trains these principal branches to a much wider angle than the Montreuil gardeners," (whom we have already stated are the most successful peach cultivators in France), "perhaps sixty or sixty-five degrees instead of forty-five. At the approach of winter he practises *l'embourgeonnement à sec*, leaving only four buds on each branch, and removing the rest neatly with a sharp knife. At Montreuil the *mère* are cut in or shortened in the first year, and disbudding is delayed till the leaves be developed in the following year. By disbudding at this season the young trees not only suffer an unnecessary check or injury, but the consequence is that the buds left, instead of forming good shoots, develope themselves into numerous *brindilles*. Late in the autumn of the second year, Sieulle cuts in, to the extent of one-third, the four lateral branches produced on his *mère* branches. In the following year he disbuds the lateral branches to the extent of one-half; and in the future management he practises winter disbudding greatly, in place of pruning, a practice long ago recommended by Nicol in his horticultural writings.

"By Sieulle's method," Du Petit Thouras remarks, "the young tree is more quickly brought to fill its place on the espalier; it is afterwards much easier kept in regular order; many poorer flower-buds are allowed to unfold themselves, but the necessity of thinning the fruit is thus in a great measure superseded, and the peaches produced are larger and finer."

Mr. Mearns, in the Horticultural Register, has suggested a method of training the Peach by encouraging the main stem to reach the top of the wall as soon as possible, and from its summit to lead two horizontal branches as far as they will extend, with the view of training the side shoots produced by them in a pendent manner, that is, to completely reverse the perpendicular method of training, so much practised by the Dutch, and which consists in training two horizontal leaders near the bottom of the wall, and to allow the shoots produced by them to grow perpendicularly till they reach the top of the wall. Neither of these modes can be recommended, so far as the Peach is concerned. The former method may be of use in the culture of the pear, but decidedly not in that of the Peach.

A very ingenious and definite method of training the Peach and nectarine has been practised by Mr. John Seymour, gardener to Miles Stapleton, Esq., of Carleton Hall, Yorkshire, which is said to have been practised by Mr. S. and his son for above thirty years. Various descriptions of this method, accompanied with diagrams, have appeared in the various periodical horticultural works published of late years. The trees intended to be so trained are planted when one year old from the bud or graft, and they produce one upright shoot and two side or lateral ones; the second spring the upright shoot is cut back to three buds, and the side shoots are shortened, to cause them to push out lateral ones, which are trained to the wall at about a foot asunder. In the course of the winter or spring of the third year, the side shoots are cut back to eleven or twelve inches, in order to get two principal leading shoots from each side shoot, the first of these about three inches from the stem, and the second about the end of the shortened shoot, the object being to double, or nearly so, the number of leading shoots. In the course of three years or nearly so the side shoots may be shortened to about fourteen inches, by which means three shoots will be produced from one, and thus ensure a speedy filling of the wall. The leading shoots are trained along an imaginary line on the wall, from the point the shoot issues from on the stem to any point beyond its extreme length. A semicircular line is described, of about ten feet radius, upon the wall, and the leading shoots passing it stand at ten inches distance from each other.

The summer management of the trees so trained is described by Mr. Stapleton's son, in the *Gard. Mag.*, vol. iv. p. 436, to the following effect: "In the spring, as soon as the young shoots have grown to about an inch long, we begin to disbud or thumb-prune them, by taking off all the young shoots, where there is no blossom or fruit, except the lowest one upon the bearing branch and that at the extreme point of it; this end shoot is allowed to grow about three inches, and is then stopped; and the buds by the fruit all broken off to about four of their bottom leaves, so as to make a cover for the young fruit until the time of thinning, when those little spurs are to be taken away with the fruit that is not wanted, and the others are retained along with the fruit that is left. By so doing we are only growing the shoot that we shall want next year for bearing fruit, which gives our trees an opportunity of extending themselves, and making good wood. Instead of taking off the summer laterals or water shoots (as they are sometimes called), as is generally done, we lay them in at regular distances, the same as we should a natural spring shoot; and if they do not bear fruit the next summer, they will produce fine bearing wood for a future year, so that we have not to shorten those strong shoots, but lay them in their whole length for secondary leading branches, as we have at this time shoots laid in above six feet long, of last year's growth, with fruit upon their laterals. When the young shoots at the base of the fruit-bearing ones, or the extending part of the leading branches, have grown four or five inches, they are tied down to the other branches as close as they will admit without breaking or pinching them, and kept close to the wall through the summer. By this means they will get perfectly ripe and firm, and not be so luxuriant as when permitted to grow from the wall almost wild; and the fruit of course must be larger when the wood is thin than when it is permitted to grow twice as thick as is necessary. There will be found, when disbudding, at the base of the shoots, small buds that are not likely to make a shoot that season, but they must be retained, as they will produce a shoot in a future year, and then bring the young wood nearer home."

NAILING THE TREES AND PROTECTING THE BLOSSOMS.—The trees being pruned, they should be immediately nailed to the wall, or tied to the trellis, if the walls be so constructed, a mode very generally adopted on the continent, but perhaps too much disregarded in this country. By using trellises of copper wire the walls are uninjured, the labour of securing the trees economised, and the expense of nails and shreds saved. The first expense, which is considerable, no doubt deters many from adopting this mode, but the saving effected in labour, nails, and shreds alone, would be balanced in ten years, not to say anything of the destructive effects of driving thousands of nails into the walls, most of which have to be taken out at least once a year. If the ordinary mode of securing them be followed, new nails should be used, or if not, the old ones put into an iron pot, and placed on the fire till they become red-hot, which will completely free them from the eggs of insects, which often lodge upon them. New shreds should invariably be used, and the old ones burnt as soon as they are taken from the branches, as they form a most secure receptacle for insects to deposit their eggs in during winter. The old nails being-fresh pointed and the shreds cut to the proper dimensions for the different-sized branches, the operation may then proceed. It is necessary to allow as much space in the shred as would hold another branch along with that to be supported, to allow of room for the wood swelling. The nails should be driven in a slanting direction, the head inclining away from the shoot, so that it may not come in contact with it, and nails having small heads should be used. The operation of nailing, according to our view of the matter, should be just before the blossoms begin to show symptoms of opening, for the longer it is deferred the better, so that it be completed before the flower buds have opened so far as to be liable to sustain injury, particularly if the trees have been partially unnailed in autumn. By this means, the young shoots, being farther from the wall during winter, will not be so much excited by the reflection of heat from it, and will consequently be later in coming into bloom, and hence have a better chance of escaping the spring frosts.

In Denmark and some other cold countries, they keep the branches of the trees at a considerable distance from the wall during winter, by unnailing them entirely, and thrusting a block of wood between the stem of the tree and the wall. They also use other means of retarding the blooming, such as covering so thickly as to exclude the sun's rays, &c. In

America, where wooden walls are much used, some cultivators have them so constructed of posts and pannels that in autumn, after the wood is ripened, this pannelling is removed, and the trees are then converted, as it were, into standards, and are consequently later in blossoming. We have often thought that if, in this country, thick canvass screens, or what is called tarpauling, were placed in front of each wall, say at the distance of two or three feet, the trees would then be as though planted against a northern aspect, and be much later in coming into blossom. For the later all our fruit trees expand their flowers, the greater chance have they of escaping our vernal frosts, while at the same time their season of ripening would not be retarded a single day. A great difference of opinion has existed with respect to the utility of covering with the view to preserve the blossom, and various modes have been had recourse to. Fern fronds, twigs of beech trees, which keep the dried leaves long upon them in spring, spruce branches, heath, straw mats, Russian mats, straw ropes suspended in front of them at two or three feet apart, woollen and common netting, Scotch gauze or bunting, canvass screens, oiled paper covers or sashes, have all been recommended.

Most gardeners cover by one or other of these means, and some that can afford it use the protection screen of Mr. Dick, described in the *Practical Gardener*, *Transactions of the Horticultural Society*, *The Gardener's Magazine*, &c., and which consists of a frame-work fixed to the wall, furnished with iron rods at top and bottom, upon which the screen or curtain of some transparent canvass is made to run backwards and forwards as required.

When frost suddenly attacks the blossom or young buds of the Peach, which is apt to be the case in spring mornings, the injury done may often be obviated, or at least very much lessened, if the garden engine be brought to play gently upon them; but this must be carried into effect so early in the morning as to be completed before the sun shines upon them, otherwise the remedy would be worse than the disease.

There is a great evil in covering too early, because such a practice would accelerate the expansion of the blossom, which is not to be desired; all that is required is protection, and no more.

THINNING THE YOUNG FRUIT. — It usually happens that Peaches, nectarines, and apricots, as well as most other fruits, set too thick, and if not artificially removed, would either fall off naturally, or be pushed off by one another for want of room. We speak of the three former of these in particular. Every fruit which sets, and is allowed to remain, above the quantity that the tree is able and ought to be allowed to bring to full maturity, acts as a general robber, and exhausts the strength of the tree to no good end or purpose. This is a branch of gardening sadly neglected, often from carelessness, want of judgment and consideration, but oftener from want of time, for there are few gardens in the empire where there is a sufficient quantity of manual labour bestowed upon them to enable the most industrious and intelligent gardener to attend to the minutiæ of every department. Those operations, therefore, that are the least conspicuous at the time, are too often neglected or overlooked. When any tree is allowed to overbear itself, there is not only a real falling off in the weight and quality of the fruit, but the tree itself is so much exhausted, by striving to support its fruit, that it is rendered incapable of producing any the season following, and not unfrequently for two or three years to come. It is a vulgar error, which we are surprised to hear many otherwise sensible men entertain, that such and such trees only bear every alternate year. The truth in nine cases out of ten is, that the trees have been allowed to carry too much fruit one year, and therefore require to rest the next, or rather to accumulate sufficient material for another crop. We have known many instances in which, when trees have produced an immoderate crop of fruit, they will not produce any more for several years afterwards. "If a tree be permitted," says Harrison, "to retain all the fruit that sets upon it, it takes a great deal of support which in part ought to have been expended in the production and perfecting of suitable wood to bear another season; and the fruit will not be so fine, nor the flavour so good, for the finer the fruit the better the flavour, provided no other means are resorted to but such as are plainly pointed out by nature."

The operation of thinning peaches should commence when the fruit is about the size of a large pea, and they must then be removed by using a sharp-pointed knife or small-pointed scissors. They should be again gone over when about the size of half-grown gooseberries, and afterwards, as a final thinning, soon after they are stoned. This last thinning, if it could be safely dispensed with, would save much of the strength of the tree from being unnecessarily exhausted; but, as it often happens in damp soils, and also in the case of trees rendered weakly from previous over-crops, that many of the fruit will drop at the period of stoning, it is considered prudent in those cases to make a final thinning at that time.

The quantity of fruit that each tree should be allowed to bring to perfection depends on such a variety of circumstances, that no positive rule can be laid down. Sickly and young trees should be allowed to produce fewer fruit than healthy and well-established ones, and large-growing sorts fewer than small-growing ones. Trees which are in any over-luxuriant state, from the richness of the soil or other cause, should be allowed to carry what may be called a heavy crop, as this will moderate the luxuriance of the growth better than any system of pruning or training, and is also more natural. "No single shoot," says the author of the *English Garden*, "should on any account be allowed to bear more than two peaches, and if it be not a strong shoot not more than one." The same author is of opinion, "that it is not the producing of the pulp which requires the great efforts of the tree, but the bringing of the seed to perfection; so that, though you have the same weight of peaches on a tree that should bear a hundred as on a tree that should bear two hundred, still the effort required for the tree would be only one half as great in the former case as in the latter, because in the former there would be only half the number of seeds."

Abercrombie is very perspicuous on this head: he says, "The rule of thinning is, if the tree be weak, the fruit must be left thin, not more than one or two on the largest shoots, and none upon the small ones, which is the only way to ensure wood for another year; upon trees of a middling strong growth you should retain but one fruit upon the smaller shoots, and two upon the middling-sized ones, and three upon the strong shoots; but the smallest kinds of fruit may be left a little thicker in proportion, and the large sorts should be thinner, that is, about six inches distance upon each shoot, and the largest of all eight or ten. In performing this work, observe to select and retain the best-placed, largest, and fairest fruit in every part, according to the above rule; and in removing the superabundant ones be careful not to disturb these. Leave no where two or more upon the same eye, especially if one exceeds the other in size, taking off the smallest, which the other would starve; but if they are of equal size, you may, if it shall seem necessary, leave both of them."

THINNING THE LEAVES OF PEACH AND NECTARINE TREES.—Harrison dedicates a chapter in his work on fruit trees to this subject, and appears to be more favourable to the practice than horticulturists in general. He says, "This treatment is particularly required in the northern and colder parts of this kingdom, because the genial warmth of the climate, even with the assistance of walls, does not afford such a degree of heat as is equal to that of the native country of the Peach." All the peaches and nectarines under his care he found improved by removing a portion of the leaves every summer, and more particularly in wet, cloudy seasons. After admitting the great utility of leaves, and the injurious effects that would follow from an indiscriminate removal of them, he proceeds as follows:—"In taking off the leaves in order to effect the ripening of the wood, I commence as soon as I have gathered the fruit (and occasionally, if the season be late, before this is entirely done): I consider that by that time the leaves have performed the greater part of their office to the wood, which has generally done growing in length, and is then only acquiring maturity; and by cutting away part of the leaves, it equally promotes that by admitting a greater portion of sun and air to it. I then cut away the leaves, at two different times, the first time as already directed, and the second about a fortnight afterwards. At the first dressing I cut about half the leaves, but not entirely away, only about half of each leaf so cut; by this means a suitable portion of light and air is admitted, and those buds situated at the base of the leaves which are cut, are not entirely deprived of the assistance required by them. The other half of the leaves must be cut off in the same manner, about ten days or a fortnight afterwards." In favourable summers and when the wood ripens in good time, he dispenses with this practice, but has found it necessary for the last twenty years, with the exception of three or four summers. It ought to be observed, that Mr. Harrison at that time lived in a high and cold situation, in Yorkshire, and he appears sensible that such would not be required in more southerly and of course warmer situations. Our intention in alluding to this practice is to draw the attention of gardeners in the north to it, who may not have perused Mr. Harrison's useful treatise. There appears to us to be a great deal of nicety observed as to the proper season of commencing the operation.

It is an old and useful practice to brush off the leaves of peaches as they become ripened, and part freely from the tree, and certainly the wood is aided in its ripening by their removal. Our only fear in regard to the aforesaid practice is, that they may be taken off before they have fully performed their especial office, and hence the injury done to the tree will be tenfold more than if they had been allowed to remain on until they fall naturally.

INSECTS AND DISEASES.—The insects most injurious to the Peach are the green aphis, black aphis, red spider, coccus or scale, and a species of chermes, which latter causes the leaves to rise into tubercles. Many absurd and ridiculous compositions, washes, and plasters have been recommended by the majority of writers on fruit trees; nor is it only to our earliest authors that the charge of ignorance or quackery is to be alone attributed, for in some of our latest works on this subject, we find receipts equally as absurd as many of those which had appeared before them.

The green and black aphis require no other nostrum but a powerful fumigation of tobacco leaves, repeated, if the first operation be not sufficient. This simple and easy remedy is ineffectual only when not applied in a proper manner. If a peach house be thoroughly fumigated in the evening, and well syringed with a powerful hand engine, with clean water, in the morning following, no vestige of the aphis will be left, excepting the dead and dying on the ground, which, for greater security, should be deeply stirred, to bury any that may be sheltered there, for it frequently happens that some of those first affected with the narcotic poison of the tobacco will drop from the trees, and so escape; the smoke, like all warm vaporous matter, having a tendency to ascend, so that the space next the floor is less affected by it than any other part of the house. A slight fumigation a day or two following, if only for precaution, will be advisable, and in all cases the application of this remedy should be put in force upon the first appearance of the aphis. Trees upon the open wall are not so easily got cleared of these pests, on account of the difficulty of confining the tobacco smoke sufficiently long around them, to effect the purpose intended. Some means should be taken to effect this, such as covering that portion of the wall to be operated on with thick canvass or tarpauling, or double matting; the fumigation may be carried on under this covering, and when completed the canvass or mats should be left on till morning, when the trees should have a powerful syringing, first from the right hand and then from the left. The same precaution recommended for the peach-house, namely, stirring the ground at the bottom of the trees, should not in this case be neglected.

Sometimes fœtid herbs are added to the tobacco, which may have their use, and thus economise an expensive article. Instead of fumigating with tobacco, some gardeners, and with good effect, particularly upon wall trees, damp the foliage on an evening with the syringe, and then dust the shoots infested with Scotch or other cheap and pungent snuffs. The moisture not only causes the snuff to adhere to the foliage and branches, but causes a sort of gradual dissolution to take place, which is sufficiently fatal to the aphis. A strong infusion of tobacco water, mixed with a small portion of soft soap, to cause it to adhere to the foliage, is often used to young trees, the branches of which are flexible, and readily admit of their points being bent down and immersed in it. The same liquid, diluted with water, is also applied by means of the syringe, or garden engine, over the whole tree. This is, perhaps, the least effectual of all the above remedies, and is certainly not the most economical.

The red spider only makes its appearance in dry, warm weather, on trees in the open air; and in peach-houses only when too much heat is kept up, and at the same time water and air are insufficiently supplied. It naturally follows that abundance of moisture is an effectual remedy, but this must be applied upon the first appearance of the insects, because the attacks of these insects are so rapid and destructive that the mischief is often done beyond remedy before it is observed. It is indicated by the leaves becoming sickly-coloured, and falling off. When this appearance takes place, no remedy can save them, but a vigorous application of water should be made to dislodge the females and wash off their eggs, which might survive the winter and commence their attacks the season following. The appearance of the red spider in any forcing-house is a certain proof that the management is bad, and that due attention is not paid to maintaining a proper atmosphere for the trees to live in. On the open walls it occurs most generally in places protected from the rains and dews by projecting copings or other shelter; and on walls heated by artificial means near to those parts where the heat is greatest, and where, if attention be not paid, the air is also too dry. Burning sulphur under the trees is a certain cure, but it is attended with danger, for if the heat applied be too great, the foliage will suffer from it as much as from the red spider.

The coccus or scale is much more difficult to get rid of than either of the others, as its natural economy is much less understood, for as yet we are ignorant of its mode or time of reproduction. The most feasible method in use is that of washing them off when the trees are destitute of leaves. They are not too minute to be recognised, particularly in spring, when the sap in the trees is in full flow. They then swell out to a considerable size, and it is perhaps then that they produce their young. Ants are stated by some to be injurious to peach trees, but we have never found that to be the case; indeed, we think the ant the gardener's friend, for wherever the aphis or coccus abounds, ants will be found in thousands luxuriating upon the honey-dew they emit.

The diseases of Peach and nectarine trees are various, and not easily accounted for; perhaps in most cases they owe their existence to improper food, either taken up by the roots from the soil, or imbibed by the leaves and young shoots from the atmosphere. There are some diseases which, no doubt, arise from accidental or wanton injuries sustained by injudicious pruning or amputating large branches, making ragged wounds in cutting with a blunt knife, pruning at an improper season, and very frequently from the bark being bruised or torn off. All that can be said on the subject of curing them is, to remove the cause by affording proper food to the roots, by making borders of a proper soil. Almost all borders, however well made at first, will become exhausted in course of time, and hence trees which have flourished for half a century will afterwards cease to prosper until the soil be renewed at their roots. Trees suffering from impurities imbibed from the atmosphere may also be restored by removing obstructions which may have arisen around them, such as erections too near to them, or large trees which may have gradually increased around them, and hence the free circulation of air is prevented, the sun obscured, and noxious and damp gases generated. The diseases which arise from injudicious pruning, wanton lacerations, or the amputation of large branches, are all within the power of the cultivator to prevent.

Mildew, gum, canker, and honey-dew, all arise from one or other of these causes, and may be removed by proper regimen. The mildew is the most common, but fortunately the most easily got rid of. Dusting the foliage and young shoots with sulphur when the trees are damp, and allowing it to remain on till it ignites gradually by the heat of the sun, will burn off this minute parasitic fungus, without injuring the foliage of the tree. But the most radical remedy is a fresh soil and free ventilation.

Hot Walls.—Hot walls have long been considered important structures in horticulture, but from the days of Switzer to within these very few years, their uses have been very much misapplied. The command of heat which they afford was long applied in spring to accelerate the expansion of the blossom, than which nothing could have been more erroneous, because, by this acceleration, it increased the chances of the blossom being cut off by late spring frosts. Modern science has shown us, what reason ought long ago to have taught our predecessors, that all attempts at accelerating the period of blossoming are bad, and that all that ought to be expected from hot walls is, the ripening of late and valuable sorts of fruits, and maturing the wood and buds for the succeeding year. Hot walls should therefore never be used in spring: in autumn they are of much importance. In regard to expense, a hollow or hot wall is exactly the same as that of a solid one of the same dimensions, —what is lost in labour is gained in the saving of materials, and their advantages are so great that no garden should be laid out in late and cold situations or climates but its walls should be so constructed, if it were for no other purpose than that of ripening the wood. When these walls were heated by means of hot flues only, many objections were justly made to them, because, while one part was scarcely warmed, others were over-heated. The most important improvement upon such walls is that recommended by Mr. Shields, gardener at Erskine House, in Renfrewshire, and may be thus described:—Over the fire-place there is an open space, through which the smoke and heated air enter the third or higher course of flues, and by means of dampers the operator has it in his power to admit what quantity he pleases into the first and second series of flues, and thus the whole wall may be heated pretty regularly. But the greatest of all improvements in hot walls is that of heating them by hot water, which is made to flow in a pipe near the ground level; the wall being built hollow, the heat gradually ascends, and heats the whole with great regularity and economy. Walls having a south and north exposure should have the cavity within four inches (the breadth of a brick) of the southern surface, as it is that alone that requires to be heated. But those having an east and west exposure should have the cavity in the centre, by which means both surfaces would derive equal benefit from it.

FORCING THE PEACH AND NECTARINE UNDER GLASS.—Structures of various forms and dimensions have been erected to bring these fruits to perfection at an early season, and a great deal has been said to little purpose as to angles of elevation, form of the roof, mode of heating, &c.

No doubt houses with a steep roof are best calculated for early forcing, and the smaller these houses are, so that they are not less than twenty feet in length and four in width, the better. Larger houses are, however, highly proper for later crops, and for the latest crop, that is to ripen just before those on the open walls, a peach-house can scarcely be too large. In such a house we should prefer the trees planted out, and grown in the standard manner. In regard to training peaches in early houses, there can be no doubt but planting them against the back wall is the best, so that the house does not exceed five feet in width, which will place the trees in the best possible position as to exposure to the sun and light, while at the same time they are far less liable to be injured by cold than if they were trained up the roof, as in general practised and recommended. There is a considerable difference also in the time of the fruit's ripening when so placed, that upon the back wall ripening ten days sooner than that trained close under the glass. The most economical structure for this purpose would be a house of sixty feet in length, divided in the middle, and five feet in width at the ground. The front wall eighteen inches high, upon which the rafters and roof should rest; the back wall nine or ten feet, against which the trees should be planted. Ventilation may be effected by placing wooden ventilators in front, with corresponding ones in the back wall. In such structures ripe peaches may be produced in the latter end of May, so that by the beginning of June the wood would be perfectly ripened. The sashes used for this division may be taken off, as the trees will be thereby greatly benefited, and they may then be placed in the next division, in which some of the latest kinds of peaches, [illegible] for example, which seldom ripen on the open walls in this climate, should be planted: these will ripen in October without fire heat, and not only prolong the season of this delicious fruit, but bring to perfection, even in cold and late situations, a class of peaches [illegible] and in full maturity in Britain. When the crop of late peaches is ripe, and of course the wood at the same time, the glasses may be taken off them, and not replaced till about the beginning of November upon the early division, which should then be pruned and put in order for another crop, thus giving double the surface that there would be if treated in the usual manner.

Pits have been recommended for early ripening the Peach, but beyond accelerating a few trees a fortnight or three weeks before they ripen on the open wall, little else can be expected of them, and fruit so produced, particularly in our cloudy atmosphere, is seldom fit for eating. The Dutch carry this branch of culture to a very great extent, and ripen peaches even in April by dung heat alone; but it should be remembered that in those parts of Holland and Flanders where this species of forcing is carried on with the greatest success, the sky is much less cloudy than in England; besides which, manual labour is much cheaper than with us, and the unwearied attention of the cultivator is proverbial.

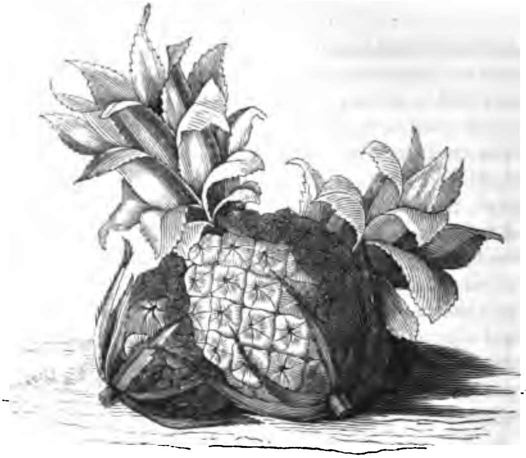
So far as regards the pruning and training of the Peach and nectarine under glass, it is exactly the same as that already described for trees in the open air. The time of commencing operations must always be directed by circumstances, and few better rules have been laid down than those of Abercrombie, the best practical writer on gardening this country has produced. "From the rise of the sap," he observes, "it occupies, in some sorts, about four months to make mature fruit; in the later varieties five months: and when much of winter is included in the course of forcing, the time is proportionably lengthened. To ripen moderately early kinds by the end of May, begin to force on the twenty-first of December: little is gained by commencing sooner but you may put the glasses on a week before, and make gentle fires, admitting a constant stream of fresh air, to get the house ready." Here we would beg to recommend the inexperienced gardener to be quite certain of the kinds of peaches introduced into a very early house; and as disappointments of this sort occur so frequently, we would suggest the propriety of proving the trees, by allowing them to ripen a crop on the open walls prior to their being introduced into the peach-house. This may be done with great certainty and success in two ways; first, by carefully removing trees off the open walls that have borne fruit, and are ascertained to be early sorts, and which may be done with every possible safety; secondly, by growing them in large pots or boxes, and when proved, to be transferred to the peach-house, taking care that the roots be regularly spread out in a horizontal direction, that is, if they have been circumscribed for room in the pots.

The temperature is laid down by Abercrombie as follows:—"Begin at forty-two degrees as a minimum, and forty-five as a maximum heat, and rise in a fortnight to forty-five as a minimum and fifty as a maximum from sun heat, giving plenty of air; in the progress of the second fortnight, augment the temperature from three to eight degrees, so as to have it, at the close, up to fifty-three minimum and fifty-six maximum from the sun heat, admitting air in some degree daily. When the trees are in blossom, let the heat be fifty-five minimum and sixty maximum. Continue to aim at this till the fruit is set and swelling. When the fruit is set, raise the minimum to sixty, the artificial maximum to sixty-five, in order to give fresh air; when the sun shines, do not let the maximum from collected heat pass seventy, rather employing the opportunity to admit a free circulation of air." These excellent rules have not been so strictly attended to by many cultivators as they ought to have been, and hence we often see them completely reversed, and instead of the temperature being highest during the day, which nature points out to us, it is often kept as high, if not higher, during the night, by an unnecessary use of fire heat, and the sashes thrown open in the day under the pretence of giving air, but to such an extent as to lower the temperature within the house below that kept up during the night. Than such nothing can be worse, for vegetables as well as animals require repose, and the proper season for that is during the night, and in the absence of the stimulating power of the sun.

That plenty of air is indispensable cannot be doubted, but very few rightly understand its effects or its application. A very small aperture will admit sufficient air to change the whole volume within the limits of an ordinary hot-house, and this may be done without materially reducing the temperature. A house properly ventilated should have the means both at front and back, and the most simple as well as most philosophical is that recommended by Mr. Atkinson, which consists of wooden ventilators built in the front parapet wall, near the ground level, by which the colder and heavier air is admitted into the house, while by opening corresponding ventilators built in the back wall near the top, the impure, heated, and consequently lighter air escapes. It is not at all necessary to open either of these very widely; if each is opened to the extent of one inch in cold weather, a considerable change of air will take place within an hour, without materially lowering the temperature of the house, and it is at all times better to open several of them to that extent, than only to open a few to a much greater. By the former method, the change is more uniform and gradual; by the latter it is more sudden, besides the injury likely to be done to the trees by a strong current of cold air rushing in upon them, which has not time to become warmed in passing over the flues or hot-water pipes. Indeed, in very early forcing, it is a good practice to have fine wire or thick gauze blinds placed within the front ventilators, as they break the current of the air, and tend to its more equal diffusion. Great attention should also be paid, particularly early in the season, to the state of the atmosphere: in still and mild days the ventilators may be opened much more widely than in keen, cold, cutting, windy weather. It is a most erroneous practice, although of daily occurrence, to ventilate houses by pulling down the top lights a foot or more, while all the front ones are kept shut; it is also so, but in a less degree, to adopt this system reversed. In regard to regulating the temperature, as above laid down by Abercrombie a century ago, we may here observe, that so little attention appears to have been paid to it, that the late Mr. Knight was induced to reprobate the practice, and to write an excellent paper on the subject, which will be found amongst his other valuable papers, published in the *Transactions of the London Horticultural Society*.

In regard to ripening peaches under glass, it has been laid down as an excellent rule to have the roof sashes moveable, for the double purpose of taking them entirely off during winter, that is, the period from the ripening of the fruit until just before the trees are to be put into a state of excitement for the succeeding crop, and also that they be partially removed while the fruit is ripening, should that take place after the end of May. Mr. Knight's practice was as follows:—"When the fruit begins to ripen, [which with him was about the second week in July] I gradually expose the house to the open air, on fine and dry days, by drawing down the lights as much as convenient in the day, and shutting them again in the evening. It is this which gives the fruit both flavour and colour." The system of removing the glass entirely is not to be recommended unless the weather be unusually fine and settled, as heavy dashing rains would deteriorate the flavour, as well as probably displace the fruit before it be fully ripened.

The Peach has been successfully forced in pots, containing not less than a cubic foot of rich, light mould. Their culture as standards, in the open air, has also been tried, but without success. In regard to the test of maturity, or the time or mode of gathering, authorities are at variance. "Peaches should never be gathered until just about to drop from the tree. They are not to be pulled, and if they do not come off with just putting your hand under them, and giving them a gentle touch, they are not ripe; and an unripe peach is a very poor thing. Some people place a net along in front of the tree, tacked on one side to the wall, and supported on the other with little forked sticks, in order to catch the fruit when they fall, and to prevent bruising. And this is a very good way when you have not time to make an individual examination of the fruit; but if one fall upon another a bruising takes place, in spite of the swagging of the net." In gathering peaches," Rogers says, "much care is necessary, lest they are bruised; clean gloves should be worn; the hand placed below the fruit should be gently raised, which will detach it, if ripe enough, without any force. When gathered, each fruit should be laid on its base, and on some moss or other soft material." The late Williams of Pitmaston says, "Should the season prove wet when the peaches are ripe, they should be gathered, and placed in a dry, airy room before they be eaten." Nicol and some others recommend a peach gatherer, and a French author, quoted by Sir Joseph Banks, observes, "Peaches are never eaten in perfection if suffered to ripen on the tree; they should be gathered just before they are quite soft, and kept at least twenty-four hours in the fruit chamber." When gathered they should be laid on clean sheets of soft paper, and kept in a dry, airy fruit room, until sent to the table for use.



THE PINE APPLE.

It is somewhat extraordinary that the time of the introduction of a fruit, even into Europe, of so much seeming importance to the luxuries of the times, and which cannot be considered of remote date, should be almost unknown. That the Pine, in the strictest sense, is a native of the New World, few we believe will deny. That it is found in great abundance in many parts of Africa, is also well ascertained, but there are doubts as to its being indigenous there, or, indeed, to any other part of the Old World. The fruits of Africa were well known to the ancients, and most of them have been described by the authors who wrote on the plants of India, with a wonderful degree of accuracy. We, however, find no reference to the fruit in question, and had it existed there can be no doubt but its name, at least, would have been recorded. It is also now found wild in the West Indian islands, but in this case we have satisfactory proofs of its being an imported plant.

It was first discovered by Europeans in Peru, where it is called *nanas*. and was by them introduced first into the West, and afterwards into the East Indies, where it has been long successfully cultivated. Parkinson, writing in 1640, says, "It was first brought from Santa Cruz, in Brazil. where it is natural, both into the West and East Indies, being not natural to either of them, but is only manured there, and not growing plentifully."

The earliest account we have of the Pine is in the *Universal History of India*, printed at Seville, by Gonzalo Hernandez de Oviedo, who went to America in 1513, and was soon afterwards appointed Governor of St. Domingo. In this work he mentions three kinds of Pine-apples as being then known, the *Yayama*, *Boniama*, and *Yayagua*. These the Spaniards designated by the general name of *Pinas*, and often tried to send the fruit, both in a ripe and green state, to Spain, but without success. They afterwards attempted its introduction by sending the crowns, but these also perished during the voyage.

The next account we have met with of the Pine, is in a *History of the New World*, by Geronimo Benzona, an Italian, who resided in Mexico from 1541 to 1555, and published his history at Venice, in 1568. André Thevet, a Franciscan monk, has described this fruit under the name of *Nanas*, and also informs us that in his time, 1555-6, it was often preserved in sugar. The year following, Jean de Lery, a Huguenot priest, makes frequent mention of it, and describes it to be a fruit of such excellence, that the gods might luxuriate upon it, and which should only be gathered by the hand of a Venus. F. Hernandez, being despatched by Philip II. of Spain to Mexico, amongst other valuable information relating to the natural history of that country, transmitted to Europe drawings of this fruit, which he designates by the name of *Maizatli*, or *Pinea Indica*.

From all that can be now learned in regard to the native country of the Pine, it would appear to be evidently a native of the New World, as it was not even heard of by name prior to the discovery of America.

The Chinese cultivated the Pine at a much earlier period than it was attempted in Europe, but they acknowledge having received it from South America. It is thus described by Father Athanasius Kircher:—"They have in China a tree called *Kagin*, yielding fruit twice a year, which, by inversion, thrusts forth the seed or kernels, like warts, or such excrescences, on the outside of the fruit, and is common to the East and West Indies, who call it Ananas, but the Chinese call it *Fam-polo-Mie:* it groweth in the provinces Quantung, Kiangsi, and Fokien, and is supposed to have been brought from Peru; the tree on which it groweth is not a shrub, but an herb, like unto Carduus; they call it *Cartriofolion*, whose fruit groweth on its stalk, of so pleasant and exquisite a taste that it may easily obtain the pre-eminence amongst the most noble fruits of India and China; the productive faculty is innate in all the parts thereof, for not only the seeds shed on the ground, but its sprout being planted, produce the like fruits."

Afzelius, a learned botanist of the seventeenth century, Mr. George

Don, and the late Joseph Sabine, Esq., appear to be of one opinion in regard to the Pine being indigenous to Africa. Afzelius says the Pine is cultivated by the natives of Sierra Leone, where they also grow wild. Mr. George Don states that they are so abundant in the woods there, that the passage is often obstructed by them, and that they grow vigourously, and produce fruit abundantly. Mr. Sabine, in *Horticultural Transactions*, in his valuable paper on the edible fruits of Sierra Leone, says, "The profusion in which these plants are found, both in frequented and unfrequented places, sanctions the opinion which is commonly entertained in the colony, that they are not of foreign origin, but indigenous inhabitants." This, however, is contrary to the opinions of scientific botanists, who hold that the Pine-apple has been carried from South America into both Africa and Asia. Yet it is difficult to conceive how such an exotic should have established itself, as they have assumed all the habits and characteristics of a native of those regions, and more especially that it should have sported into varieties (as is the case more particularly in parts of Asia) so remarkably different from any that are known to exist in the countries of which alone they are supposed to be the original inhabitants. "Two sorts of pine-apples are cultivated by the colonists at Sierra Leone,—one called the white, and the other the black pine-apple; they are not so large as those produced in England, but have a superior flavour. The wild varieties are numerous." Louneiro mentions a variety of pine which occurs in Cochin China, which continues quite green when ripe, with a white flesh, from which it would appear, that not only are they cultivated over a wide extent of the Chinese empire, but that they have there also sported into varieties.

Linnæus gives Surinam and New Spain as the native countries of the Pine, but how they migrated to countries so remote, although enjoying nearly an equal degree of temperature, is, we believe, totally unknown.

How the Pine found its way into Europe is, even now, as little known as its introduction into Africa or Asia. We have, however, some data to guide us in this respect.

About the middle of the seventeenth century, M. Le Cour, of Leyden, in Holland, procured plants, as some say, direct from America, but according to others, and, we think, with greater probability, from the West Indies, and cultivated them at Driehock, his country seat. The first attempt of Le Cour in regard to the cultivation of this fruit, was to grow them without bottom heat, as dry stove plants: he had, however, afterwards, recourse to low pits and tanner's bark, and soon afterwards published a work, in which he details his mode of culture, and gives plans of his pits. It is not improbable but that the gardens of England were supplied from Le Cour's.

It does not appear by the writings of Lord Bacon to have been in his time introduced into Europe: he nevertheless particularly mentions it in his "Essay on Plantations and Colonies," but is silent as to having seen the fruit, which, had it been in England, could not possibly have been unknown to him. It is recorded that the Protector Cromwell, about 1657, received a present of pine-apples, but these were in all probability brought from the West Indies, or from Holland.

Some have found a very circuitous route for its introduction, and suppose it to have been brought by the East India Company of the United Provinces from China, when they returned from their first embassy to that country. This opinion is founded on the circumstance of the secretary to that embassy, John Nievhoff, mentioning this fruit particularly, and it appears he also gave an engraving of the Ananas plant in his history of that embassy, from which work the following description is taken:—"Here grows a well-tasted fruit, called Ananas, which was first brought from the West unto the East Indies, where it is now to be had in great abundance. It is about the bigness of a citron, of a yellow colour, and well scented; full of juice, and pleasant in taste, if eaten when ripe; for it is much like unto strawberries with wine and sugar. Upon the top it is crowned with a cluster of flowers and leaves, and at a distance is not unlike an artichoke, but without any pricks at the corners; the middlemost stalk, being the biggest, upon which the fruit grows, is about two feet high, and has fifteen or sixteen leaves. Round about this stalk grow other lesser stalks, with young fruit upon each. Whosoever will eat of this fruit, must first of all take off the outward skin, and then cut into pieces, and so infuse them in wine, or water, to draw out the biting quality that is in it, otherwise it will make blisters upon the tongue; nor is that all, for it is very dangerous to eat much of it, because it is apt to bring on dysentery. And though this fruit be hot, yet the leaves thereof are cooling, having a sour and corrosive quality, which is only found in cooling herbs; and the main hazard is produced by its pleasantness, which is such, that it will melt in the mouth like sugar."

The celebrated Evelyn has furnished us with what may be safely considered as correct data in regard to its first appearance in Britain:—"I first saw," says that interesting writer, "the famous queen pine brought from Barbadoes, and presented to his majesty, but the first that were seen in England were those sent to Cromwell, four years since."—*Diary*, 9th August, 1661. And quoting from the same interesting work, July 19th, 1668, "I was at a banquet which the king [Charles II.] gave to the French ambassador Colbert. Standing by his majesty at dinner in the presence, there was of that rare fruit called the *King Pine*, growing in Barbadoes and the West Indies: the fruit of them I had never seen. [It appears that there is some mistake in stating this to have been the *King* Pine, as that variety was raised from seed in this country, from a seed taken from a rotten fruit, which came from the West Indies to Henry Heathcote, Esq.] His majesty, cutting it up, was pleased to give me a piece from his own plate to taste of, but in my opinion it falls far short of those ravishing varieties of deliciousness described in Captain Ligon's history, and others; but possibly it might, or certainly was, much impaired in coming so far." From this it is clear that this was an imported fruit.

Philips, in his *History of Fruits*, thinks it probable that it was from the crowns of there pines that Rose, the royal gardener, raised the first plants that fruited in England, if not in Europe. This opinion is feasible enough had we not equally strong assertions that they were received from Leyden, and first cultivated here by Sir Matthew Decker, at Richmond, about 1715. This opinion is strengthened by Gouge the historian, who says that it was Sir Matthew Decker who first introduced the culture of the Ananas; and also from the circumstance of a work being published in 1726, intitled "An Account of the Ananas, or West Indian Pine-apple, as it now flourishes in Sir Matthew Decker's Garden, at Richmond, in Surrey, under the care of Henry Telende."

There are two curious paintings still in good preservation, representing Rose, the royal gardener, presenting on his knees a pine-apple to King Charles. One of these, and in all probability the original, is in the collection at Kensington Palace; and the other, which formed part of the collection of the celebrated Horace Walpole, represents the same person presenting to King Charles, in a garden, in front of his palace at Ham, attended by two of his favourite breed of spaniels, a pine-apple, which will prove the rarity of the fruit and the importance of the present. We have, however, no positive proofs of these being the produce of the royal garden, and should be rather inclined to think they were not, or if so, that the plants which produced them had been lost. The Sloanean MSS. in the British Museum, inform us that the pine was not introduced until the year 1690, when the Earl of Portland procured plants from Holland. There is also a painting by Netscher, in the Fitzwilliam Museum at Cambridge, of a landscape, with a pine-apple, stated to have been the first fruited in Britain, and which was produced in the garden of Sir Matthew Decker, above noticed.

Had Rose fruited the Pine-apple so early as is supposed, it is singular that it should have been so soon after lost, and still more so that it had not been known to Lady Mary Montague, as it would appear that that intelligent lady had neither seen nor heard of such a fruit till she saw it served up in the dessert at the Elector of Hanover's table, in 1716, when on her journey to Constantinople. The high rank this extraordinary female held in society placed her in the way of either seeing or hearing of this fruit, however rare. Her having noticed them in Hanover proved their cultivation to have been known on the continent, and it is not altogether improbable but those mentioned by Evelyn, as well as those presented to Cromwell, came from thence, and that the paintings of Rose and his royal master had no reference whatever to his being the first cultivator.

Abercrombie distinctly says, that "Holland was the first European country where the culture of this plant was attempted, and the temperature of heat discovered to bring it to a proper fruiting state, and from which country we, here in England, were supplied with the first plants, and hints for its culture, in which we have so greatly improved as to equal, if not excel, all other countries of Europe."

The introduction of the Pine is stated in the *Hortus Kewensis* to have been so early as 1690, by Mr. Bentick, but it is to be only considered in this case as merely a botanical plant. To those who have not an opportunity of referring to the pamphlet published in 1726, on the method of growing the Ananas, as practised by Sir M. Decker, we can refer them to "A General Treatise of Agriculture, Husbandry, and Gardening," by Professor Bradley, published in London, 1757, p. 433, where a pretty full account of Mr. Telende's practice will be found, with additional notes, by Bradley. The same authority informs us that, in 1730, pine stoves of different kinds were established in all the principal English gardens; and those in the Chelsea botanical garden, then under the direction of Philip Miller; W. Parker, Esq., near Croydon, Surrey; Mr. Fairchild, at Hoxton; John Blackburn, Esq., in Lancashire, are particularly mentioned. As a curious circumstance in regard to the improvements in flues, we may notice here that Fairchild "raised his fire flues above the surface of the floor of the stove, which carries very good reason along with it; for first, as these flues are not buried in the earth, there is no danger of their raising damps in the house; but on the contrary, if any damps should rise there by any other means, the dry heat which will proceed from such flues will rectify it, and render it fit for plants, by quickening its motion; for the more rarified any fluid is, the quicker is its motion; so the less rarified it is, so much slower it is, or the greater stagnation, and may become so dense by extreme cold, as to have no motion at all, and be entirely fixed." This may be taken as the first improvement in flues of which this country can boast. Justice, in his *British Gardener's Directory*, published in 1744, informs us that pine stoves had been then erected in Scotland, and gives the plan of one erected by him in his own garden, near Edinburgh, in which the Pine was fruited for the first time in North Britain.

Medicinal Properties and Uses.—The medicinal properties of the Pine are stated by Dr. Wright, who had sufficient opportunity of studying them in the West Indies, to be of a detersive quality, and are better fitted to clean the mouth and gums than any gargle whatever. Their uses in domestic economy are too well known to require any particular notice here: we may, however, state, that in the West Indies they are much used to flavour rum, and a palatable wine is made from them, almost equal to Malmsey. In Britain it is made into marmalades, and is also preserved in sugar. The usual mode of serving them up for use at the dessert is, to cut them into thin horizontal slices, paring the outer rind off with a knife, and serving it to the guest with a fork. In the West Indies the slices are cut obliquely, nearly in the direction of the pips, and this mode is now often followed in this country also.

Many attempts have been made to import the fruit of the Pine into this country from the tropics. The most successful we recollect to have heard of is related by Philips, in his *History of Fruits*:—"This fruit was for the first time imported, as an article of commerce, from the Bermuda islands, in the summer of 1820. The importation consisted of about four hundred pine-apples, of the species called the Green Providence. These were purchased by Mr. Mart, of Oxford Street, fruiterer, who informed the author that about two-thirds of the quantity arrived in good condition. We observed that those pines that were packed with the roots, arrived in a better state than others that were cut off in the usual manner." May not those who have to send their fruit to a distance, say, for example, from Scotland or Ireland to London, take a hint from this circumstance?—and may we not yet expect to see a regular supply for our public markets brought from the West Indies, by steam?

Varieties.—Taylor, in his Treatise on the Ananas, published in 1769, describes five varieties; Miller, in 1737, describes five varieties; Speechly, in 1796, describes fourteen; Nicol, in 1822, describes ten; G. Lindley, in 1831, describes thirty-seven; Rogers, in 1834, describes nine. The *Encyclopedia of Gardening*, in 1835, describes eleven, and enumerates, in a systematic table, fifty-two sorts; and Mr. Munro, in *Horticultural Society's Transactions*, the whole number growing in these gardens, with a view to determine the correct nomenclature,—no less than fifty-two kinds, from which he selects the Queen, Moscow Queen, Black Jamaica, Brown Sugar Loaf, Ripley, St. Vincent, Black Antigua, Enville, Lemon Queen, and White Providence, as being the best.

The following is the excellent classification drawn up by Donald Munro, principal director of the London Horticultural Society's gardens, and published in vol. i. part ii., *Second Series* of these Transactions.

Species I.—Ananassa bracteata.
1. Scarlet (or *Brazilian*).

Species II.—Ananassa debilis.
2. Wave-leaved.

Species III.—Ananassa lucida.
3. King. 4. Fisherwick striped Globe.

Species IV.—Ananassa sativa.

* *Leaves spineless.* (*a*) *Flowers purple.*
5. Havannah. 6. Smooth Havannah.

(*b*) *Flowers lilac, nearly white. Fruit globular.*
7. Green Antigua.

Fruit pyramidal.
8. Striped smooth-leaved Sugar-loaf.

** *Leaves with minute spines* (*about eleven in an inch on an average*).
(*a*) *Flowers purple. Fruit oval.*
9. White Providence. 10. Green Java. 11. Black Jamaica.

Fruit cylindrical.
12. Orange Sugar-loaf. 13. Downton Havannah.

Fruit pyramidal.
14. New Jamaica.

(*b*) *Flowers lilac.*
15. New Demerara. 16. Striped Surinam.

*** *Leaves with middle-sized spines* (*about six or seven in an inch on an average*).
(*a*) *Flowers purple. Fruit cylindrical.*
17. Sierra Leone. 18. Anson's. 19. Montserrat. 20. Trooper's Helmet.

Fruit pyramidal.
21. Green Providence. 22. St. Vincent.

(*b*) *Flowers lilac. Fruit cylindrical.*
23. Globe. 24. Lemon Queen. 25. Otaheite. 26. Surinam. 27. Bucks Seedling Globe.

Fruit pyramidal.

28. Brown-leaved Sugar-loaf. 29. Brown Sugar-loaf. 30. Mealy-leaved Sugar-
loaf. 31. Black Sugar-loaf. 32. Striped-leaved Sugar-loaf. 33. Trinidad.
34. Bucks Seedling. 35. Enville. 36. New Enville. 37. Spring Grove Enville.
38. Lord Bagot's Seedling. 39. Blythfield Orange.

**** *Leaves with large-ridged spines (about four in an inch on an average).*

(*a*) *Flowers purple.*

40. Black Antigua. 41. Welbeck Seedling. 42. Ripley.

(*b*) *Flowers lilac. Fruit globular.*

43. Russian Globe. 44. Russian Cockscomb.

Fruit cylindrical.

45. Queen. 46. Ripley's Queen. 47. Green Queen. 48. Muscow Queen.
49. Striped Queen. 50. Silver-striped Queen. 51. Antigua Queen. 52. Blood
Red.

Of these, the first four scarcely deserve cultivation, unless considered as plants of ornament, or where a full catalogue of Pines is intended to be cultivated. The Scarlet Brazilian, which has only been a few years introduced, produces a fruit from three to five pounds weight. The same may be said of the Wave-leaved Pine, neither of which is yet very common. The King has been cultivated since the time of Miller, but is not worth house-room, although it sometimes produces fruit from three to four pounds weight, but is very uncertain in starting. It appears to require less water and a greater heat than most other sorts. The Fisherwick Striped Globe is a handsome-growing, erect plant, and readily distinguished from all others. We have had it several years in cultivation, but have never seen a fruit of it.

It is from amongst the varieties of *Ananassa sativa*, that now follow, that we are to look for the best and most profitable sorts.

SELECT LIST OF PINE-APPLES.

1. Havannah. [*Syn.*, Smooth Antigua, Brown Havannah, Smooth-leaved Antigua; and Ripley, Old King, Common King, of many collections. It has no affinity to the Ripley, and can only be confounded with the Old, or Common King, from its green colour, and having few or no spines. There appears to us to be some confusion between the Havannah of the Horticultural Gardens and the Green Antigua.]—Leaves, narrow, light green, considerably mottled with brown; spines, few only, towards the points of the leaves often spineless; fruit, cylindrical, large, weighing from three to five pounds; pips, large, and very flat; flesh, pale, lemon-coloured, not very juicy, nor a first-rate pine.
2. Green Antigua. [*Syn.*, Smooth Green Havannah, Smooth-leaved Green Antigua.]—Leaves, long, narrow, and succulent, extremely brittle; spines, few

or none; flowers, lilac, nearly white; fruit, globular and large, from three to five pounds weight; pips, flat and broad, rich yellowish green, when not over-ripened; flesh, pale yellowish; flavour, excellent. The plant is tender, requiring to be handled carefully, to prevent the leaves from being broken, which is very injurious to this sort. In our opinion one of the best of pines.

3. White Providence. [*Syn.*, New Providence, Providence, Mealy-leaved Providence.]—Leaves, very large, broad, and spreading, very mealy, peculiarly tinged with purple, when in a good growing state, very brittle, and liable to be broken, which should be carefully avoided; spines, small, thickly set; fruit, very large; pips, very broad and flat, scarcely projecting at all; the largest pine in cultivation, if we except the Trinidad; colour, dark green while growing, reddish yellow when ripe; flavour, very inferior to all other pines. Speechly informs us, page 8, "that it is to be regretted that this sort requires so long a period to bring it to a fruiting state, and that he had been informed that they do not come into fruit before the fifth or sixth year." We have found it quite the reverse, as with us it fruits within eighteen or twenty months, and is more apt to start while young than any other kind we know. A pine requiring five or six years' growth can never be worth cultivating. Many extraordinary reports have been published as to the weight of this pine: Mr. Lindley, we think, is near the truth when he states the weight at from six to eight pounds; "but it frequently," he adds, "under good management, attains the weight of from twelve to fourteen pounds."

4. Black Jamaica. [*Syn.*, Montserrat, Black Barbadoes, Jamaica.]—Leaves, very long, marked with dark purple, tapering very much towards the point, somewhat keel-shaped, and rather mealy; spines, very small, short, and regular; fruit, large, somewhat pyramidal, or oval, depressed at the ends, from three to four pounds weight, often more; dark olive while growing, brownish yellow when ripe; pips, flat, very large; flesh, deep yellow; scales, covering one-third of the pips, and ending in lengthened points; flavour, excellent. One of the most valuable of pines, and much better adapted for fruiting during winter than most others. Crown, large and spreading, and very mealy. It was justly remarked by Speechly, "that there is a singularity in this pine which enhances its value, viz., in the autumnal months, and even during winter, it produces a fruit much more swelled and more perfect than that of the other sorts, and is not liable to suffer by decay or imperfection, either in the fruit or the stock, as is usual with those of the other sorts in a season when the sun's power is not great." This excellent sort requires rather more heat than the varieties of Queens and some others. It ought to be in every collection.

5. New Jamaica. [*Syn.*, St. Kitts, Brown Antigua, New Black Jamaica, English Globe, Montserrat of some gardens, St. Vincent's Sugar-loaf, and, according to Mr. Munro's paper, Mr. Rae's St. Vincent's.]—This is the Black Jamaica of Speechly. "It differs from the Black Jamaica in the colour of the leaf, which is rather paler, and in the margins being slightly reflexed. The fruit is pyramidal, and slightly mealy. The colour, black, on approaching maturity, changing to that of a dark orange; pips, differ from those of Speechly's variety by being half covered with the scales, and rather more prominent and angular; flesh, pale yellow, somewhat opaque, slightly fibrous, sweet, a little acid, but very pleasant, rich, and highly-flavoured; crown, middle-sized; leaves, rather numerous and spreading. An excellent summer fruit, but is apt to become

deformed during the winter months; it generally weighs from three to four pounds."—*Hort. Trans.*

6. New Demerara. [*Syn.*, Harrison's New Pine, Demerara.]—Leaves, rather long, slightly keeled, very broad and strong, dark green and mealy; spines, very small and regular; fruit, round, rather depressed at each end, from three to four pounds weight; when ripe, dull ochre colour, with slight tinges of red; pips, large and prominent, very mealy at the centre; flesh, pale yellow, firm and juicy; crown, large, having the leaves long and upright.

7. Sierra Leone.—Leaves, long, broad, with revolute undulated margins, bluish-green, blotched with a darker colour; spines, middle-sized, regular, and short; fruit, cylindrical, from three to five pounds weight, of a dull ochre colour when ripe; flesh, yellowish-white, juicy, and well-flavoured; crown, large, producing gills at its base, as also at the base of the fruit, which sometimes fruit before the other is half grown.

8. Anson's. [*Syn.*, Lemon Antigua, Anson's Queen, but not the Otaheite, which is also sometimes called Anson's.]—Leaves, long, erect, and slender, in which particulars it very much resembles the Otaheite, as well as the Brown Sugar-loaf; fruit, of a bright lemon colour when ripe, from three to five pounds weight; pips, largish, flat, fourteen or fifteen deep, prominent at the margins, and depressed at the centre; flesh, white, or very pale yellow, sweet, without any acidity; crown, of medium size; a very good sort.

9. Montserrat. [*Syn.*, Cape Coast, Red Ripley, New Ripley, Cochineal, Brazil; The Copper, Copper-coloured Antigua, Bogwarp, and St. Kitts, King, Sumatra, and Malacca of some collections.]—Leaves, longish, somewhat keel-shaped, glossy green, tinged with brown; spines, particularly dark, which sufficiently distinguishes it from every other pine; fruit, cylindrical, often broadest at the top, and tapering downwards; from three to five pounds weight; dark green, and very mealy, turning when ripe to a pale orange, tinged with copper; pips, flat and middle-sized; flesh, lemon-coloured, solid, rather juicy; crown, large, upright, with many leaves. We have never had a good fruit of this sort, although we have observed it better with other cultivators.

10. Trooper's Helmet. [*Syn.*, Hussar, Cockscomb, Broad-leaved Java.]—Leaves, of medium length, upright, and flat, palish-green, mealy on the under-side; spines, medium-sized, and very regular; fruit, nearly cylindrical, dark ochre colour when ripe; from three to five pounds weight; pips, large and flat, rather depressed at the centre; flesh, bright lemon colour, juicy, and well-flavoured; crown, large, often many, or proliferous.

11. St. Vincent's. [*Syn.*, Green Olive, St. Thomas', Green St. Vincent's, Stubton Seedling, Sugar-loaf Bahama, and the Green Providence of some collections.]—Leaves, rather longer than the Common Queen (although Speechley says that they are not longer), somewhat keel-shaped, green on the upper side, and mealy on the under-side; fruit, pyramidal, dingy yellow when ripe, about three pounds weight; pips, flat, rather depressed at the centre; flesh, pale yellow, juicy, sweet, and high-flavoured; crown, of medium size; leaves, numerous.

12. Green Providence. [*Syn.*, New Green Olive, Wollaton Providence, and the Royal Providence and Green Antigua of some collections.]—Leaves, long, and very broad, keel-shaped at the base, terminating in a sharp point; the upper surface green, and the under very mealy, very different from any other pine; spines, regular, and of medium size; fruit, broadest at the top, pale orange

when ripe, from three to six pounds weight; pips, large, and rather prominent; flesh, pale yellow, sweet and well-flavoured; crown small. This is an excellent summer fruit, but does not swell off well in winter.

13. Otaheite. [*Syn.*, Anson's.]—Leaves, long, erect, not very broad, but of nearly equal breadth till near the top, where they terminate somewhat abruptly; dark, brownish-green,tinged with brown, very mealy, on the under-side; spines, very regular; fruit, inclining to oval, deep orange-yellow when ripe, from four to six pounds weight; pips, large and flat; flesh, pale yellow, very juicy and well-flavoured; crown, small and erect, not often proliferous.

14. Lemon Queen. [*Syn.*, White Barbadoes, Lemon-coloured Barbadoes, Barbadoes Queen, and Ripley's New Queen of some collections.]—Leaves, broad, short, and very mealy; spines, six or seven to the inch; on some of the leaves they are incurved; fruit, ovalish, pale lemon-coloured when ripe, from three to five pounds weight. The whole plant readily recognized from all others by its leaves, which are grooved or channelled, and the margins often involute. Pips, large and flat; crown, medium-sized, often proliferous; not a very good winter pine.

15. Globe. [*Syn.*, English Globe.]—Leaves, narrow, very erect, slightly keeled, requiring less room than any other sort, from its upright growth; bluish-green on the upper surface, very mealy on the under-side; spines, very regular; fruit, globular, darkish yellow when ripe, from three to five pounds weight. It should be carefully watched when ripening, as it is apt to roll on the plant, if not cut in time. With some it is said to be tardy in fruiting, but we have never found it so. Pips, medium-sized, slightly prominent; flesh, yellow, juicy, rich, and agreeably flavoured; crown, small and erect, seldom proliferous.

16. Brown-leaved Sugar-loaf. [*Syn.*, Striped-leaved Sugar-loaf, Mocha, and the Brown Sugar-loaf and Antigua Sugar-loaf of some collections.]—Leaves, broad, strong, somewhat keel-shaped; dark-green, tinged with purple, not very mealy; spines, medium-sized and regular; fruit, dark yellow, inclining to orange, from three to five pounds weight; pips, large; flesh, deep yellow, and exceedingly high-flavoured; crown, medium-sized, seldom proliferous. A very excellent pine, and has been cultivated in this country since the times of Miller and Justice.

17. Brown Sugar-loaf.—Leaves, very much resembling the Enville, but less mealy, and more tinged with brownish red. The fruit also resembles the Enville, as does also the crown, but it is superior to it in flavour, and in this respect equal to any other of the Sugar-loafs, which are all admired for their excellent flavour; from three to five pounds weight. This pine is valuable to the cultivator, as it swells readily during the winter.

18. Black Sugar-loaf. [*Syn.*, Copper-coloured Barbadoes.]—The habit and form of the fruit somewhat like the last. An excellent summer sort, but does not swell well in winter.

19. Striped-leaved Sugar-loaf. [*Syn.*, Green striped Sugar-loaf, White Sugar-loaf, Prickly-leaved Sugar-loaf, Striped Sugar-loaf, Purple-striped Queen, Striped-leaved from Jamaica, Brown-striped Sugar-loaf, Bird's-eye Bahama.]—Not very dissimilar to the last varieties of Sugar-loaf in the fruit; the leaves are striped, as the name implies.

20. Mealy-leaved Sugar-loaf. [*Syn.*, New Mealy-leaved Sugar-loaf, Allen's Seedling, White Sugar-loaf, Dominica, and the Green Sugar-loaf, Anson's, Brown

Sugar-loaf, and Otaheite of some collections.]—Leaves, channelled or grooved, tinged with dull brown; resembling the Lemon Queen in habit more than any of the other sorts of Sugar-loafs; fruit, pale yellow, sugar-loaf shaped; from three to five pounds weight; pale yellow or lemon-coloured, when ripe; pips, middle-sized, flattish when well grown, prominent and pointed when not maturely grown, or when too hard forced, but this,—we may observe, is the case with most pines so circumstanced; flesh, nearly white, slightly aromatic, and pleasant; crown, small, and seldom proliferous.

21. Trinidad. [*Syn.*, Pitch Lake Pine.]—Leaves, very long and straggling, broad at the base, narrow towards the top, keel-shaped, brownish purple on the upper sides, very mealy on the under-side; spines, growing almost in groups or clusters; fruit, much lengthened and of a large size, from a foot to fifteen inches in height, and from five to six inches in diameter; dark orange, slightly tinged with red when ripe; pips, large, and slightly angular; flesh, pale yellow, any thing but well-flavoured. It is worth growing only on account of its large size, and its being as yet rather rare. Crown, very small.

22. Enville. [*Syn.*, Old Enville, Enville Sugar-loaf, Cockscomb.]—Leaves, medium length, broad, and strong, remarkably mealy; spines, thickly set and very irregular; fruit, pyramidal, from four to seven pounds weight, brownish red when ripe; pips, large, and slightly prominent; when well grown, the surface is nearly level; flesh, almost white; flavour, excellent; crown, small, when it comes single, but it very frequently comes proliferous, having, perhaps, from twelve to twenty small semi-crowns. Next to the Queen, the most profitable pine we know. This excellent variety was originated from seed, at Enville, a seat of the Earl of Stamford, in Staffordshire, but at what exact period we know not, but it is evident since the time of Speechly, as he makes no mention of it in his excellent Treatise, published in 1796.

23. Black Antigua. [*Syn.*, Jagged-leaved Black Jamaica, Wortley's West Indian, Brown Antigua of Speechly.]—Leaves, very long, narrow, and sharp-pointed, inner leaves much tinged with palish brown, under surface very mealy; spines, large, remote from each other; fruit, inclining to oval; dark ochre-coloured when ripe, from four to six pounds weight; pips, very large and prominent; flesh, pale yellow, juicy, and high-flavoured. One of our best pines, but care should be taken that it be cut before it becomes too ripe, as, like the Globe above noticed, it is apt to crack, and even to rot, upon the plant. This observation applies to all the sorts abounding in juices.

24. Ripley. [*Syn.*, Indian Black, Heaton House Montserrat, Old Ripley and Montserrat of Nicol, and Brown Sugar-loaf of some collections.]—Leaves, long, broad, and slightly recurved, tinged with reddish brown, and very mealy on both sides; spines, strong and irregular, reflexed at the margins. Fruit, oval, from three to five pounds weight; pale copper-colour when ripe; flesh, almost white, with a rich agreeable flavour; crown, medium-sized, and altogether an excellent pine, particularly for winter forcing.

25. Russian Globe.—Leaves, short, broad, slightly keeled, recurving over at the ends (which causes them to take up considerable space), much tinged with dark brown; spines, long, thickly set; fruit, globular, from three to four pounds weight; dark orange, inclining to copper, when ripe; pips, large and flat; flesh, yellow, very sweet, and slightly perfumed; crown, very large, spreading at the top. A very good pine, and swells well during winter.

26. **Russian Cockscomb.**—Leaves, short, broad, and strong, slightly furrowed and revoluted at the margins, slightly tinged with brown, very mealy; spines, strong, and remote from each other. Fruit, globular, pale orange when ripe, from four to six pounds weight; pips, large and flat; flesh, pale yellow, juicy, and richly flavoured; crown, small. Although an excellent summer or autumn fruit, seldom swells well during winter.
27. **Queen.** [*Syn.*, Narrow-leaved Queen, Broad-leaved Queen, according to Mr. Munro, but we think that there are many varieties of the Queen, some of which are not worth growing, particularly a short-leaved sort, which produces many suckers; Old Queen, Common Queen.]—Leaves, short, broad, and strong, thickly covered with meal; spines, strong, remote from each other, but at regular distances; fruit, cylindrical, from two to four pounds weight; rich, deep yellow when ripe; pips, small and prominent; flesh, pale yellow, juicy, and high-flavoured; crown, medium-sized, seldom proliferous. Certainly the most valuable of all pines for ordinary purposes.
28. **Ripley's Queen**, as it is erroneously written, instead of Ripley Queen, as it was introduced from the Ripley estate in Jamaica, where it is considered as indigenous to that locality. "It can only be considered in the light of a slight variety of the common Queen; the leaves are broader, and a clearer green colour than the former, and the plant is not so subject to throw up suckers. It is an excellent variety, and much cultivated."—*Pract. Gard.*, new edition.
29. **Muscow Queen.**—Leaves, short, broad, and stout; spines, large; fruit, cylindrical, resembling the common Queen, of which it is probably an improved variety. It is rather rare as yet, but its excellence demands for it a place in every collection.
30. **Antigua Queen.**—Leaves, light brown, mottled, and very mealy; spines, strong; fruit, oval, from four to five pounds weight; pips, large and prominent; flesh, deep yellow, exceedingly high-flavoured.

In addition to those stated at the beginning of this list, as being unworthy of cultivation, we may add the following:—

The Smooth Havannah, Green Java, Orange Sugar-loaf, Downton Havannah, Striped Surinam, Surinam, Buck's Seedling, Buck's Seedling Globe, Spring Grove Enville, Lord Bagot's Seedling, Blithfield Orange, Welbeck Seedling, Green Queen, Striped Queen, Silver-striped Queen,—(Speechly informs us that this variety was an accidental production, from seed of the common Queen, in the Welbeck Gardens, during the time he had the direction of them. He also states, page 3, that in "the year 1768, he raised above seventy pine-apple plants from seeds that were sent to the Duke of Portland, from the West Indies, most of which varied in some distinctive circumstance, either in their leaves or fruit. The result of this experiment did not, however, terminate according to his wishes, for, although the new varieties thus obtained were in general fruit of great elegance and beauty, yet many of them turned out of inferior quality." It is singular that since Speechly's days so few have tried the same experiment, or if they did, that so few varieties of pines have been produced worthy of cultivation,)—Blood Red. We suppose that Speechly introduced this pine from the continent, for he says, at page 19 of his Treatise,—"In the year 1771, I brought a fine plant from Holland, by the name of the Red-fleshed Pine. The gentleman in whose possession it was assured me that its fruit cut as red as any kind of peach at the stone, or as the root of red beet. It fruited in the garden at Welbeck, in 1774, but the fruit was very small, cut hard and stringy, and was not in the least red." The exterior of the Blood Red only is of that colour.

PROPAGATION OF THE PINE-APPLE.

The Pine is usually propagated by crowns and suckers; the former are produced on the fruit, and are in general single, but in the case of some others they are proliferous, or nearly so, some fruits producing as many as from twelve to twenty small and imperfect ones; but these seldom make good plants: the latter are produced from the stem of the plant, near its base, and are in general strong and to be preferred. Suckers are also produced from the roots and under-part of the stem, but unless in cases where the variety is scarce they are in general rejected, as are also gills, which are a species of suckers which proceed from the footstalk of the fruit. The Pine is, in common with most other plants, capable of being increased by seeds, and also by planting the stems of such plants as have produced their fruit, which will, if supplied with heat and moisture, continue to send up suckers for a considerable length of time.

SEEDS.—The seeds of the Pine are produced in the inside of the pips or protuberance of the fruit; they are small, and of a dark-brown colour, not unlike those of the apple or pear. Seeds are rarely produced in this country, and even in the tropics it is calculated that there are not more than one found even in thirty or forty fruit. The seeds when produced are sown in pots of light, rich mould, about an inch apart, and covered about a quarter of an inch. They are then plunged in a mild bottom heat, and kept covered with a bell-glass to guard them against the attacks of the wood-louse, which often infest pine-stoves, and are very fond of feeding upon the young pine plants. When the seeds germinate, and the young leaves begin to develope themselves, air should be gradually and carefully admitted to them until they have attained the height of four or five inches, when they may be accustomed to the atmosphere of the house or pit. It is almost needless to observe, that the nearer to the glass and light the pots of seedling pines are placed, the better, to prevent them from being drawn up slender and weak. When they have attained the height of five or six inches, they should be potted off into single pots, and afterwards treated like young plants originated from crowns or suckers, as will be afterwards noticed.

CROWNS.—The crowns are procured when the fruit is used, and should, after having lain for two or three days in a moderately shaded place in the pine-stove, be divested of a few of the lower leaves, *but only such as come off freely:* the base of the crown being slightly pared smooth with a knife, it is then ready to be planted in light, rich, vegetable mould, and plunged in a mild bottom heat, in a low and close pit or frame. The sooner the crowns are planted after being separated from the fruit the better, for the practice of keeping them for weeks, under the pretence of drying them, as is too often done, is radically bad, and is not only a great loss of time, but of manifest injury to the plant. On this subject, Kennedy, writing in 1767, observes:—"The common method with the crowns is to cut off the soft, pulpy end that is twisted out of the fruit, and to pull off a few of the under leaves, and lay them some time in a shady place to harden. It is certain that a plant lying so long in drying, after it is deprived of its nourishment (the fruit), must be a detriment to it, and greatly retard its growth, for the leaves become soft and languid, like any other plant that is much dried in a sun-shiny day; and were it not for the nature of the leaves, being strong, and of a very different texture from woody plants, it would show its wrong treatment as much as those would were they treated in the same manner. The cutting off the soft end that is twisted out of the fruit deprives the bottom of the plant from pushing out a root, for it remains to the last just as it was cut off, and the pulling off the leaves from the bottom destroys most or all of the little knobs, which are the rudiments of the roots, all of which grow when treated in a proper manner."

When potted, the smallest-sized pots that the plant can be got into the better, as they will root much sooner in such than in larger ones. They will require no water from the time of planting till they have begun to make roots and to grow, provided they be not placed in a situation too hot and dry by the application of fire heat. The best situation for rooting young pines is a low, close pit or frame, heated by dung; the general steam arising from which, condensing on the glass over them, and falling back on the plants or moistening the atmosphere around them, will be sufficient for them until they have made roots an inch or two in length, at which time a little water may be applied over head with a fine syringe, and also at the roots with a small watering-pot. Young pines are often rooted by being planted in the tan or leaves with which the pit may be filled; this we think objectionable, because the roots will sustain great injury when removed from the bed and potted for the first time. We have always rooted our young pines in small pots, and as soon as we perceive that the roots have nearly filled these pots they are carefully transplanted into other pots one size, or two, at the most, larger. The process of rooting must be carefully attended to, by frequently turning some of them out of the pot, to see what progress they are making. Frequent shifting, although attended with considerable labour, is, nevertheless, the fundamental rule for expeditious cultivation. A moist and steady heat being maintained, strong crowns in six months time will become strong plants. Gills are to be treated in a similar manner, but as they are usually small, three, four, or five may be set round the edges of a pot of the size called small thirty-twos; these, when rooted and of proper size, are to be placed into single pots also.

SUCKERS.—This, if not the most natural, is at least the most expeditious mode both of obtaining fruiting plants in the shortest time, and also a numerous progeny. Most cultivators since the time of Speechly prefer suckers to crowns, and those that are produced from the middle of the stem are esteemed the best. That author, however, observes, that crowns which are stout at their base are equal to suckers, and our own opinion is, that either, if well grown, will produce equally good and handsome fruit. The crowns, as we have above stated, require rather a longer time to come to perfection, and in general make the handsomest plants if they are strong in the first instance. Abercrombie objects to suckers which rise at a distance from the stem, and adds, that they are apt to form ill-shaped hearts. This we think is, to a certain extent, true; but the same objection may be made to stem-suckers when they are what is called one-sided, that is, more fully furnished with leaves on the one side than on the other. Such, however, may be thrown aside; for if pines are well managed, there will be always an abundance of perfectly formed and strong suckers to keep up a supply.

The management of suckers, even while upon the parent plant, requires our consideration; and as the object decidedly is the production of large and strong suckers, every attention ought to be paid to promote their growth; but at the same time this must be considered subordinate to the swelling off of the fruit, as the plant has both to nourish at the same time. On this subject opinions are considerably at variance: some, to obtain large fruit, destroy all or most of the suckers as they appear, by thrusting into their hearts a sharp-pointed, three-angled stick or rod of iron, and by turning it round two or three times complete its destruction.

In performing this operation, great care is necessary to prevent the stem of the plant from being injured at the same time. By following up this plan, it will appear sufficiently obvious that the increase of the stock will be very much interfered with; and, to counterbalance this loss of plants, recourse must be had both to the preservation of the crowns, and also to the old stools or stems after the fruit has been cut. These should be divested of their leaves by cutting them off to within an inch or two of their base, and plunged into a strong bottom-heat, supplying them abundantly with water, both at their roots and also over their tops. The stem of the plant is furnished with many buds or eyes, which, when properly excited, will push out suckers to the extent of three, five, or more; but, as large and well-formed plants are desirable, it will be judicious not to allow more than two or three to remain on each stem. These, when of sufficient size, or rather when they can be readily separated from the old stem, are to be taken off, potted, and treated as other young plants. Where it is convenient, we prefer to pot at once all our young pines; but where space or heat is limited, they may be set closely together in a frame, planted in decayed leaves. Some very excellent pine growers nurse all their young plants in this way, and there is no doubt but it is the most economical; our objection to it is only that the roots are liable to be injured when taken from such a bed, and potted for the first time. We ought also to observe, that, when space is limited, the old stools, instead of being retained in the pots as above, may be entirely shaken out, or planted in a bed so prepared, with their ball entire, by which means they will occupy much less space; or they may be stuck in the bed between the rows of full-grown plants, or indeed in any unoccupied space within the stove. This mode is practised generally in the case of some sorts, such as the White Providence, which is not apt to send up suckers at the usual time, or in the usual manner. The stem of this sort is divested of its leaves, and kept excited for the purpose of breeding from. They are sometimes, instead of being planted perpendicularly, laid horizontally in the bed, about an inch or two under the surface, and in this way send up abundance of young plants.

A mode of employing the vigour of the old stock to nourish the sucker has been practised in various ways since the time of Speechly, and some have even gone so far as to allow two or three suckers to remain on each old stool, even till they have produced their own fruit. This is a practice which cannot be too strongly condemned; for fruit so produced is always of a small size, and far inferior to what it would be if the suckers were treated as individual plants. The most successful cultivator of the

Pine, by leaving the sucker long on the old stool, that we have heard of, is Mr. Marsland, of Woodbank, near Stockport, who exhibited before the London Horticultural Society, in 1818, a Queen Pine which weighed three pounds fourteen ounces, and measured seventeen inches in circumference. The same person exhibited before the Society, in 1819, specimens of the New Providence, Globe, Black Antigua, and Enville, all grown in the following manner:—"In November, 1819, as soon as the fruit had been cut from the plants, which were then two years old, all the leaves were stripped of the old stocks, nothing being left but a single sucker on each, and that, the strongest on the plant; they were then placed in a house where the temperature was about sixty degrees, where they remained till March, 1820. At this period the suckers were broken off from the old stocks, and planted in pots from eight to twelve inches in diameter, varying according to the size of the sucker. It may be proper, however, to observe, that the length of time which the young sucker is allowed to remain attached to the mother plant, depends in some degree upon the kind of pine: the tardy fruiters, such as the Black Antigua, and others, require to be left longer than the Queen, and those which fruit readily. After the suckers had been planted, they were removed from the house where they had remained while on the old stock, to one in which the temperature was raised to seventy-five degrees. Immediately upon their striking root, the largest of the suckers showed fruit, which swelled well, and ripened between August and November, being, on the average, ten months from the time the fruit was cut from the old plant, and seven months from the time the sucker was planted. The fruit so produced, though, as may be expected, not of the largest description, I have always found to be richer and higher-flavoured than that grown on older plants. The suckers of inferior strength will not show fruit in the same season, but in the following they will yield good fruit, and strong suckers for a succeeding supply. Those suckers are to be preferred that are produced on plants that have ripened their fruit in November, for those taken from plants whose fruit is cut in August, or earlier, are apt to show fruit in January or February, while yet remaining on the mother plant. But whenever this happens, the sucker should be broken off immediately upon being perceived, and planted in a pot, so as to form a root of its own to maintain its fruit."

It is no doubt injurious to the swelling of the fruit to allow many suckers to remain on the mother plant, but it is sometimes attended with danger to displace them, or even to destroy them, as stated above. If a pine be in a vigorous state of health, it is not injured by being allowed to produce one or even two suckers, which, however, should be removed when they are what is termed ripe, that is, when they will separate freely from the old plant. They will do this when about twelve or fourteen inches high, and when their bottoms are hard, woody, of a brownish colour, and full of small round knobs, which are the rudiments of the young roots. If it be attempted to take them off sooner, they are not only liable to be broken, but must also injure the old plant, from the force required to effect a separation. We prefer the mode of allowing the sucker to remain on the plant until it can be readily separated from it without force, and immediately planted in pots corresponding in size to that of the plant. The old and absurd practice of laying them by for a week or two to dry is extremely baneful to the plant, and were it not that the Pine is very hardy, it would be killed by such a practice. The Pine should at no period of its existence sustain the least check in its growth; yet the contrary doctrine is laid down by most who have written on the subject, particularly the barbarous and injurious mode of checking them to cause them to start into fruit. If the Pine do not show fruit at the proper age or size, without being subjected to such treatment, the fault lies with the grower, and not with the plant, and there must be under these circumstances some part of the treatment radically bad.

On this subject Rogers justly observes,—" In all that has been written by Kennedy,"—who, we may mention, *en passant*, is an excellent author, and we regret to find him so seldom quoted,—" Speechly, and others, on the culture of this fine fruit, and proved by the long experience of the writer, there is one obvious rule of practice established which should never be lost sight of or neglected, namely, that from the moment the crown or sucker is rooted up to the time its fruit begins to ripen, the plant should sustain no kind of check whatever. The growth should be from first to last a uniform progression, without pause or hindrance, in order that the plant may attain its utmost volume, and produce full-sized fruit in the shortest time."

Many eminent pine cultivators follow the practice of Kennedy by allowing the suckers to remain on the old plants after the fruit is cut until the whole crop is finished, giving them plenty of water and a moderate heat. As the old plant has nothing to feed but the suckers, they will grow to a large size before the whole crop is cut. No doubt this is an excellent plan in large establishments, when the fruit of a whole house or two ripens within a month or six weeks of each other; and this is the practice in many market gardens, in the royal gardens, and by ourselves while at Claremont, at a time when pines were extensively grown there. It enables us to collect the principal crop of suckers at once, and to place them into a pit by themselves to root. In private gardens, when a limited succession of pines is required during the whole year of only one or two per week, this rule could not be acted on with the same advantage; but even in these, the suckers might be permitted to attain full maturity before they are separated from the old plants, as the house could not be cleared out so as to be entirely replenished with plants for a succession crop until the whole of the fruit was gathered; consequently the old plants would not be occupying space that could be advantageously used otherwise, unless it were deemed expedient to fill up the fruiting-house from the succession pits as the others are ripened off.

"By allowing the suckers to remain so long on the mother plant," Kennedy says, "they grow much faster than if they were taken off as soon as the fruit was cut: they also harden in the stem, and as they grow hard they also form small knobs on the sides of their stems, which push strong roots immediately on their being planted in the bark, and the stem, by being hard, is in no danger of rotting. By being planted immediately they are taken off, they lose no time, and are not retarded in their growth, as they are when taken off and laid to dry, which is the common method of treating them."

When the crowns and suckers are first potted they should be placed in a brisk bottom-heat, to encourage the formation of roots; and until these begin to appear they should have no water, the moisture of the atmosphere of the pit or frame being sufficient; but if this should be otherwise, from the heating of the tan or leaves, it will be necessary to water them occasionally over-head with a fine syringe. During the heat of the day, particularly in summer, they should be carefully shaded, and as little air admitted by ventilation as possible; for, as the plants have no roots, they require little of that element beyond what finds its way to them through the laps of the glass. Indeed, they may be considered to be in the exact situation of cuttings, which, it is well known, root most freely when shaded and covered with a glass, for the exclusion of the air.

In separating the sucker from the plant, the following excellent directions laid down by Speechly cannot be improved:—"When the suckers are taken off, the operation should be performed with great care, that neither plant nor sucker may be injured: to prevent which, one hand should be placed at the bottom of the plant, to keep it steady, the other as near to the bottom of the sucker as you conveniently can; after which, the sucker should be moved two or three times backwards and forwards sideways, and it will fall off with its bottom entire. Whereas, when a sucker is bent downwards immediately from the plant, it frequently either breaks off in the stem or splits at the bottom.

Soil.—Most authors agree with the majority of cultivators in approving of a strong, rich soil for the Pine to grow in, particularly in the latter stages of its growth. We are, however, not singular in thinking otherwise, experience having taught us that this fruit prefers a lighter and more porous soil than is generally used for it. Crowns and suckers we almost invariably strike in leaf-mould, or light, gritty soil, enriched with sheep dung. Succession plants in a light, marly loam, where it can be had, enriched with bone dust and sheep dung; fruiting plants in the same, using ground bones for drainage. Light, rich, turfy loam is a very good soil for the Pine, but no soil ought upon any consideration to be sifted, and the newer or fresher such soil is the better, nor should it be used a second time. Our reason for preferring a light, porous soil to a strong and retentive one, is, that filtration may go on more freely, for no plant suffers more from excess of stagnant damp at the roots than the Pine, while at the same time it requires, particularly while growing rapidly and while the fruit is swelling, a very liberal supply of water. Besides, the Pine is usually grown plunged in some medium or other, such as tan, leaves, dung, or other fermentable matter; hence the air is prevented from acting on the pots in the same way as it does on pots exposed upon a platform or stage, and if once the soil becomes too damp it is long in regaining its proper degree of humidity.

Water.—The Pine, like all other plants, derives most of its nourishment from water, or rather that nourishment must be taken up by it in a liquid form; and as soft pond or rain water contains naturally the greatest portion of that proper food, it follows that this only should be used. Liquid manure, that is, the drainings of a dunghill, or water in which rich manure, such as sheep, deer, or cow dung has been steeped, is often applied to the Pine; but this application should be to the roots only, as its effects on the leaves would be injurious. In regard to the quantity given at once, or the periods which should elapse between each application, there can be no rule laid down, as so much depends on the state of the plant, the mode of culture followed, and many other circumstances, which nothing but the good sense of the cultivator can determine. Where pines are grown in small pits heated with dung or leaves, or both combined, and where a sufficient quantity of steam is allowed to enter the pits, little water, particularly during winter, will be needed. But in larger houses, and where fire heat alone is employed, they will require a larger supply, not only at their roots but also over their leaves, the atmosphere of the pits; the top of the bed on which the plants stood was nearly level with the ground line, *e*, *e*; the sand is moistened when a moist atmosphere is required, which gives out a genial steam, and which is regulated at pleasure by increasing or diminishing the fire below." Mr. Stewart's experience led him to the conclusion that tan was perfectly useless, not only as a source of bottom heat, but also for rooting young plants in, and that in situations where coals are cheap, his pit is the most economical plan that can be adopted. "The temperature kept during spring and summer is from eighty to a hundred degrees, through the day, and as low as sixty-five or sixty degrees during the night; in autumn and winter it is as low as fifty-five or fifty degrees.

Fire heat and tan were jointly employed for maintaining the necessary temperature until 1759, when a short treatise was published by Adam Taylor, of Devizes, "Containing plain and easy directions for raising this most excellent fruit without fire." In this treatise, rules are laid down for the formation of deep wooden frames or pits, filled with hot dung and tan, into which the plants were plunged, and as the heat declined within them, linings of warm dung were applied all round. This, and carefully covering the glass during winter, showed the possibility of growing this fruit in great perfection. Subsequent experience has proved the correctness of this plan, and many have since effected the same result by the use of leaves alone. However, it becomes a question whether either be more economical than employing fire-heat conjointly with fermentable substances, and this can be determined by local circumstances only. That there is a considerable expenditure of labour in the management of linings is undeniable, as well as a sad loss of the better parts of the manure so employed. This waste of labour is greatly increased by the injudicious management of the linings, some people being never content unless they be turned frequently, which not only requires much labour, but is a great waste of dung or leaves, by promoting decomposition, while at the same time a very considerable quantity of heat is lost at each turning, by its being allowed to escape, particularly in winter. The temperature of the pit or bed is thus lowered, and it takes some days afterwards before the proper temperature be again got up. We turn our linings very seldom, —never while they retain a good heat, but we keep them steady by adding fresh dung or leaves on the top, working up the previous lining about a foot deep, and by this means they will last during a whole winter, with only one general turning, and that for the purpose chiefly of abstracting the rotten and decayed portion, to allow room for fresh supplies. We also use our materials fresh, neither dung nor leaves being previously fermented, by which we save all the heat that would be otherwise wasted by previous fermentation. But where coals are expensive, and the rate of labour low, the case is different. There is also another consideration to be taken into account, namely, the probability of obtaining either leaves or good stable dung in sufficient quantity. So far as the health of the plants is concerned, we think that they thrive better when grown in small pits, heated with leaves and dung, than when grown in fire heat alone.

Many, we know, doubt the possibility of growing pines in this manner, and those probably depend more upon the assertion of Speechly,—who says, "It would be so difficult to keep the Pine-apple plant in any part of this island, throughout a severe winter, without the assistance of fire, that I believe I do not assert too much when I say it would be impossible," —than upon that surer test, experience. We have long grown pines in pits, heated internally with leaves, and externally lined with mixed leaves and dung, and never lost a plant from a deficiency of heat. Besides, the Pine is far from being a tender plant, and will sustain, without much apparent injury, a low temperature, providing it be not too long exposed to it at a time.

Baldwin and M'Phail, both excellent gardeners, long ago recommended the disuse of fire-heat for young and successional pines. The latter of these writers says, "Succession plants grow exceedingly well in pits covered with glazed frames, linings of warm dung being applied to them in cold frosty weather. The north wall of a pit for this purpose had best be only about four feet above the ground; and if about two feet high off it be built in the form of the outside walls of any cucumber bed, the linings will warm the air in the pit more easily than if the wall were built solid. The linings of dung should not be lower in their foundation than the surface of the tan in the pits in which the plants grow (for it is not the tan that requires to be warmed, but the air among the plants); and as during winter the air in the pits among the plants, exclusive of sun heat, is not required to be greater than sixty or sixty-five degrees, strong linings are not wanted; one against the north side, kept up in cold weather nearly as high as the wall, will be sufficient, unless the weather get very cold indeed, in which case a lining against the south side may be applied. In cold, frosty weather a covering of hay or straw, or of fern, can be laid on the glass above the mats in the night time."

In the gardens at Wimpole, in Cambridgeshire, Pines have been raised and fruited for years in pits, somewhat on M'Phail's plan, without fire or dung heat, the required temperature being kept up by leaves alone, both for the bed and the linings, an account of which will be found at length in the *Transactions of the Horticultural Society*. In the same work is also detailed the practice of the late Mr. Gibson of Beechworth Castle, in Surrey, who grew his pines with the heat of leaves alone, under a deep frame. In the fruiting-frames the plants were placed three inches above the rims of the pots, by which means the roots extended amongst the leaves, and hence required less water, and produced fruit, in his estimation, of a higher flavour.

Most of the commercial gardeners round London, with whom economy is a leading object, grow most of their young Pines in frames and low pits, sometimes filled with dung, but more generally with tan, as the latter is procured at little expense; and when the heat declines within, linings of warm dung are applied. And in this way, Mr. Greenshields, a most intelligent gardener, at Englefield House, Berkshire, has long grown this plant in a very successful manner. The details of his practice are given by him in the *Transactions of the Horticultural Society of London*, the substance of which is as follows:—In the end of August or beginning of September he prepares a pit, capable of containing his whole stock of crowns and suckers, four hundred of which, he informs us, are contained in a pit twenty-four feet long and six feet wide; the plants are set about an inch and a half deep, in rotten tan, not in pots. The temperature in autumn is kept to about seventy degrees, and the pit shaded from the sunshine. During winter the temperature is kept between fifty and sixty, by the application of external linings, and the glass is covered with mats in the night. In this way they remain till March, by which time the roots have run nearly over the surface of the bed. They are then carefully taken up, and planted in pots six inches in diameter for the largest, and smaller in proportion. At this potting the roots are carefully preserved, and a few of the under leaves removed; the plants are also set deep in the pots, which, Mr. Greenshields justly observes, is a great advantage to pine plants in all stages of their growth. When potted, they are set in pits, shaded, and kept close for four or eight days. This is an excellent part of Mr. Greenshield's practice, as shading is necessary to prevent newly-potted plants from flagging, until they have made roots to support themselves, and exclusion of air, to cause the plants to root more speedily. For the first three weeks the temperature is kept at seventy, by which time the young plants will have formed roots sufficient to require a freer admission of air as well as water, which is applied about twice a week, as well as being frequently sprinkled over them with the engine in dry and hot weather. The linings are kept so as to maintain a heat within the bed of sixty-five degrees, covering at night with mats, until the heat of summer renders this unnecessary. About the month of June the tan in the bed is turned over one fork deep, and the plants shifted, with their balls entire, into pots two sizes larger, using mould in as rough a state as possible. By the middle of August or September they will require shifting again into still larger pots, in which they are to remain to perfect their fruit, and are at this time removed into the fruiting house, which is heated by fire heat.

The plants are set thin in the bed which is now prepared for them, and the house kept rather warm, to cause them to root freely. Air is freely admitted when the weather will permit, and the plants, as well as the bark bed and foot-paths of the house, sprinkled with water when the atmosphere within it becomes too dry. Fire heat is not applied until the temperature falls to sixty, and from that to sixty-five is all that is allowed till the middle of January, when a rise of five degrees will be necessary. In April the bed is turned over to the depth of two feet, and a little fresh tan is added, quite at the bottom. While the bed is preparing for them the plants are gone over, and three or four of their lower leaves are removed, and a little of the old mould taken from the surface and replaced with fresh. To guard against excess of bottom heat, the plants are only half plunged at first, and the house kept warm by fire heat until the heat in the bed comes into proper action. Air and water are given as required, and the house sprinkled with water every evening just before it is shut up. No further attention is required till the fruit is swelled to its full size, when all waterings should be discontinued, and a free circulation of air admitted, to bring the fruit to its full flavour.

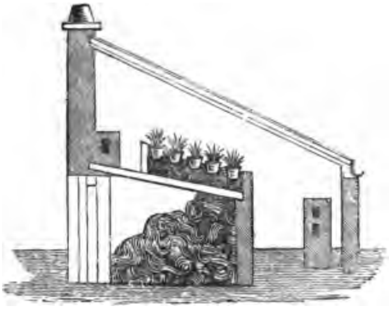
This method of culture is at once expeditious, economical, and certain of success; and is applicable to plants intended to show their fruit eighteen months after they are removed from the parent plant, and to ripen off within two years, which is perfectly practicable with Queens, Envilles, and other fast-growing sorts. We will finish our abbreviated account of this mode of culture in Mr. Greenshields' own words:—"The rules," he says, "that I have laid down in this communication, all apply to the treatment of pine plants that are intended to give a general summer crop. When ripe fruit is required earlier or later, the different pottings, &c., must be varied accordingly. The compost mould to be used at all the pottings should be strong surface loam and half-rotten hog dung, of each equal quantities, kept as rough as possible, in which state it should be applied on all occasions. The mixture should never be used when more than twelve months old. It may here be observed, that no pine plant should be checked in its progress; for the consequence of checking is always a premature and weak production of fruit." Mr. Loudon, in reviewing the above paper in the *Gardener's Magazine*, vol. i. p. 429, observes: "This last observation deserves the particular attention of gardeners, as it applies not only to pines, but to the whole class or division of vegetables termed by botanists Monocotyledones, including palms, bulbs, and grasses. It does not apply in any thing like the same degree to Dicotyledones."

Baldwin, who was a very successful pine grower, grew all his plants, prior to their fruiting state, in pits heated by dung linings. These he afterwards, like Greenshields, removed into a fruiting-house heated by fire-heat, and such was our practice while at Claremont, as will be found fully detailed in the *Practical Gardener*.

We may here remark, that we have not unfrequently observed this practice completely reversed; young plants being grown in large houses heated by fire-heat, and when grown to their full fruiting size removed into low, moist pits. The consequence of this is, that instead of their showing fruit at their proper age, they are excited to grow, and in some cases do not fruit for several years; and even then their fruit is seldom so large as it would be, in plants treated as we have stated above, when only twenty months or two years old.

In addition to those we have quoted above, who have practised and written on the cultivation of the Pine without fire-heat, we may also notice Mr. Weeks, who observes:—"This incomparable fruit can be obtained in frames without fire-heat, having only the assistance of tan and dung, and is more easily brought to maturity than are early cucumbers." And in this way, he continues, any one that can procure pines can grow pines. On the margin of Taylor's Treatise, in the library of the London Horticultural Society, an anonymous annotator affirms, that he finds by experience that the dung of four horses is sufficient to work two frames, each twenty-six feet in length, and six in breadth, one for the fruiting-house and one for succession plants; and that it may be reasonably expected to cut forty fruit yearly after the first year, and that the dung is as valuable for the field or garden as if this use had not been made of it.

Dung and fire-heat combined were for years successfully employed in the Portman nursery at the time Mr. Munro, now of the Horticultural Society, had the direction of that establishment. These pines were grown in large hot-beds, and fruited in houses which, although furnished with flues, were seldom heated by them, the heat being derived from rank stable dung in a state of high fermentation, placed in a pit below the plants, and which will be perfectly understood by a glance at the annexed sketch.



A floor was formed by supporting tiles upon iron bearers, the joints of the tiles being made tight, to prevent the escape of steam into the house. The pots were set upon this floor, but not plunged, and the interstices between warmed the air of the house.

A variety of other contrivances have been had recourse to, such as turning steam into vaults of air, cisterns of water, or amongst rough rubble stones, which imbibe the heat and give it out to the plants above. This latter plan was tried and succeeded at Alnwick Castle, in Northumberland, some years ago, as was also that of Count Zubow, at St. Petersburg, which consisted in heating cisterns of water by causing steam pipes to pass through them : over these cisterns a frame covered with faggots was placed, on which the soil was laid in which the plants were planted (not in pots), an account of which, by Dr. Fisher, will be found in *Horticultural Transactions*, vol. iii. p. 430. Gunter, of Earl's Court, near London, tried heating by turning steam into a vault underneath, to heat the mould in which the plants were planted : but owing, we suppose, to some mismanagement, the soil became so parched and dry as to materially injure the plants. This could not have been the case if attention had been paid to regularity in watering. The late Mr. John Hay, of Edinburgh, a garden architect of some merit, exemplified similar modes in different parts of Scotland, and succeeded perfectly. Nor is this an invention of yesterday,—Speechly and M'Phail both knew of it, but neither had much confidence in its success.

It does not appear that either of these modes of obtaining a bottom-heat for pines will ever supersede that of tan, dung, or leaves, employed either singly or mixed together. Our opinion is, that leaves are decidedly the best, not that we object so much to tan on any other ground than that it has been proved to afford no manure when thrown out of the pine pits, whereas the mould of decayed leaves is next to indispensable in all gardens. Leaves also retain their heat longer, are less violent, and more uniform, and the steam arising from them is much more congenial to the plants than that arising from tan while undergoing fermentation.

Speechly, we believe, was the first who brought the use of leaves into notice as a substitute for tan, and employed them to a great extent while at Welbeck. They should be collected in autumn as soon as they fall from the trees, because at that time they are more easily raked together, and have not begun to decay. As fast as they are collected they should be carted to some convenient place, where they may lie to heat; but, as at this period of the year the pine pits require to be made up for the winter, our own practice has in general been to fill the pits with them at once as fast as they can be procured, treading them firmly down as the pit is filling: if this is properly done they will not sink or settle much, neither need there be any apprehension of an over-heat. Some, however, prefer to leave them in heaps for a week or two, to become heated, and this we would perhaps also do if we were not in general anxious to have the pines all arranged in their winter quarters as early in autumn as possible, and while the weather is tolerably mild. If the leaves be dry when collected, they should be watered as they are put into the pit; but such as are intended to be stored for spring and early summer use, should be put together as dry as possible, to prevent fermentation commencing too soon; the consequence of which would be, a great loss of their heat. If put together compactly, and covered with any temporary thatch, it would tend to preserve them.

When the pits are filled, the pots are immediately plunged; but this process requires more care in packing the leaves tight round them than when tan or dung is used, as the leaves are apt to shrink from the pots, and the heat thus escapes into the house. To prevent this, some people surface their beds with tan, saw-dust, or half-decomposed leaves, to the depth of two or three inches; we have tried all these modes, and have no great objection to either, provided too much be not made use of, so as to prevent the fine genial steam from rising through them. Beds of leaves properly made up in autumn will last till the autumn following without any addition being made to them, or being disturbed, which is not the case when either tan or dung is used. At the end of that period, when the beds are preparing for another succession of plants, a large portion of the leaves will be found in perfectly good condition to be retained, and to be mixed with the fresh supply.

Many persons give a preference to oak leaves alone, and Speechly appears to have been of this opinion, but "repeated trials convinced him that the leaves of beech, Spanish chestnut, and hornbeam will answer the purpose very well;" but he rejects the leaves of lime, sycamore, ash, and of fruit trees in general, as being unfit for this purpose. The leaves of ash and fruit trees may be rejected, as the former give out a very disagreeable odour while in a state of fermentation, and those of fruit trees in general are seldom found in sufficient quantities to be worth the trouble of collecting. We have for many years taken the leaves of forest trees indiscriminately, having extensive lawns and pleasure-grounds under our care, that require to be swept and cleared of the leaves as they fall from the trees. Instead of lime-tree leaves being speedily decomposed, we have, from repeated observations, found them last as long as those of other trees, the chestnut perhaps only excepted.

That leaves are in many places far more economical is certain, when we consider that from two-pence to three-pence per bushel is often paid for tan *delivered*, and that when exhausted in the pine pit it is of little or no use, whereas decayed leaves, as we have already observed, are a most valuable ingredient in all gardens. But, perhaps, the greatest advantage of all is, that fruiting plants once set in a bed of leaves do not require to be again removed until the fruit is gathered; and not only is there a great saving of labour in this, but a vast advantage gained to the plants by not having to move them, which can never be done without some injury to them, however carefully the operation be performed.

Flax-dressers' refuse has been recommended, but this cannot often be found in sufficient quantity, nor can it, when reduced to mould, be considered as a good manure, as it consists chiefly of woody fibre.

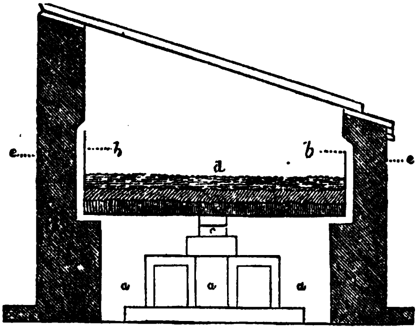
Whatever material be used for producing a bottom heat, the greatest caution should at all times be paid that this be not carried too far. We believe that more mischief is done from an excess of it than from the reverse. Speechly affirms, and with great truth, "That pines suffer more from this one circumstance than from all other accidents put together, insects excepted. When this excess happens near the time of their fruiting, the effect is soon seen in the fruit, which always comes ill-shaped and exceedingly small." This is particularly to be guarded against at the time of their showing fruit. And on this same subject, Kennedy, with in addition to the condensation of steam generated by watering the footpaths, flues, hot-water or steam pipes, &c. During summer, pines grown in houses so heated should be syringed over their leaves every evening, if the weather is not unusually cloudy, and during winter, when the fire-heat is necessarily strongest, they will also require such watering every second evening, or oftener; one of the greatest improvements in modern pine culture is copious steaming, and a liberal supply of water. A dry heat is unnatural to most plants, and is the very hot-bed for the production of insects; while, on the other hand, a moist heat is the proper state for tropical plants, and will be the best guarantee against the appearance of insect enemies. In giving water, it is better at all times to give little at a time, and to give it the oftener; and it ought to be particularly observed, that plants growing in small pots require more than those grown in large ones, and for the same reason, plants making their roots, less than such as have them fully developed. All plants do not require the same quantity of water, as all are not alike able to decompose or absorb it. Some kinds require much less than others, such as the majority of what are called Black Pines, requiring less than Queens, Providences, &c. The root of the Pine should be kept rather dry than moist. The leaves may be kept moister by steaming or syringing than is usually done, and when this practice is followed, great caution is required in watering at the root, as the foliage absorbs its share, which lessens the supply required from the roots. Cold or frosty water should never be applied; it should be brought a few degrees above temperate before it is applied to the plants, whether at the root or on the leaves. Syringing pines over their leaves, although hinted at by some of our older authors, was a practice not followed by many of their readers; and indeed we have often seen gardeners sucking the water from the base of the leaves of their pines with a straw, and many went so far as to employ a syringe made on purpose. Modern improvements have taught them better, and the garden syringe is now as much employed for the dispersion of water amongst them as the former was for its abstraction.

TEMPERATURE.—When the Pine was first introduced into this country, the necessary temperature was kept up by fire heat alone, bottom heat being then not thought of; and the plants were placed on stages, together with succulent plants, which were then much cultivated. "Ingenuity," as Mr. Loudon justly observed, "however, soon suggested, and experience approved, the advantage of the latter; first, in preserving a moist, equable heat; and, secondly, in preventing the plants from feeling, so much as they otherwise would, any casual declension in the fire heat, or sudden vicissitude in the temperature or moisture of the external air. Not that they cannot be grown without bottom heat, but that, according to the present arrangement of gardens, they are grown with it at less expense, with less trouble to the gardener, and with greater certainty of success, than by any other mode hitherto practised."

It appears the latter improvement took place towards the latter end of Miller's time, as he says, "The plants were at first kept in dry stoves, during winter, placed on scaffolds, after the manner in which orange trees are placed in a greenhouse; and that in summer they were removed to hot-beds of tanner's bark, under frames. They soon, however, began to erect low stoves, called succession houses, and bark pits under deep frames, for suckers and crowns."

The advantages arising from the employment of a genial bottom heat became daily more obvious, until at last pines were grown to great perfection by that means alone; nor has the correctness of the principle been called in question by those most eminent in the culture of this fruit, if we except a theory endeavoured to be established in 1819, by the late Mr. Knight, but in which he has had few followers.

The late Mr. Stewart, of Valleyfield, in hopes of establishing Mr. Knight's views in cultivating the Pine without bottom heat, invented a pit in 1820, of which the annexed cut is a representation:—*a*, *a*, are two flues, and supported over them, on brick props, *c*, is a flooring of pavement, (boarding or tiles would answer equally well,) covered with a layer of gravel and sand, *d*, on which the plants in pots were placed; at the sides, *b*, *b*, were openings, to admit the heated air from below to warm



roots as regards both temperature and potting, fewer accidents would befall these plants.] If the tan bed send up a good heat, the use of the stove in the pinery may be deferred till the middle or end of the month. One object is to keep the temperature up to a given minimum; another, to interfere with fire heat when the declension in the natural climate is unseasonably abrupt. Thus, sixty-two degrees at the end of September, is more severe than fifty-eight degrees at the end of October.

"*November*. Work regular fires every evening, and occasional fires on cold mornings, and throughout severe days. A violent heat would be pernicious. The maximum to aim at, for the day-time, in rigorous frosts, is sixty-five degrees, independent of any rise in the thermometer from occasional sunshine.

"*December*. Attend punctually to the furnace in the afternoon, late at night, and timely in the morning. Between five and nine in the forenoon, never let the course of the fire heat relax; but if, between nine and three, the sun should shine sufficiently to raise the thermometer to seventy, the furnace may be stopped [by the aid of dampers], and need not work again till three in the afternoon.

"*January*. Recruit and regulate the stove evening and morning. To have the heat defective or in excess, would be alike prejudicial.

"*February*. The furnace must be carefully attended, as the three principal hours of regulation come round. Maintain fires all day in rigorous weather.

"*March*. From the returning influence of the sun, and the gentle impulse of the stove, the plants will be excited strongly into growth. To conduct them by an equal progression, the fire heat should be regularly sustained morning and evening, and raised, as noon approaches, to seventy, seventy-two, and seventy-five degrees, in case the power of the sun alone has not elevated the thermometer, by ten in the morning, to at least seventy degrees. To make the continuance of fire in a hothouse during the day depend merely on the presence or absence of frost, is to treat a stove like a greenhouse. According to the climate to be imitated, the tenor of the artificial heat ought to bear some analogy to the revolutions of temperature caused by the sun, as it respects both the history of a day, and the rise and acme of a growing season.

"*April*. Continue fires regularly while the sun is down; and when the weather is chilly and gloomy, work the furnace all day.

"*May*. Go on with the evening fires; have a gentle heat in the early part of the morning, at least till appearances promise a fine warm day. Some managers, to save fuel, dispense with the stove as soon as the thermometer can be kept, by the shelter of the house, and the influence of the tan bed, from sinking below sixty degrees, at the coldest time between sunset and sunrise. But on the principle laid down in March, the heat ought to be progressive where pines are grown, and, indeed, where any fruit is forced that will repay the cost; in the pinery, then, the minimum in May is sixty-four degrees at the beginning, and sixty-eight at the close.

"*June.* If the weather be seasonable, no fire heat will be wanted; but if it be midsummer according to the calendar, resume fires in unseasonable, cold intervals, in order to give sufficient air without checking the plants that have been excited by a higher temperature than that which the natural climate may happen to be during an anomalous day or two."

In the management of fires and the economy of fuel, much may be gained by giving the necessary ventilation as early in the day as possible, so as to admit of the house being shut up early in the afternoon; by which arrangement a considerable quantity of solar heat will be included, and also by setting the fires in order before that heat has declined and the temperature lowered, which will take a greater force of fire heat to replace. Fire heat should be employed during the day in winter, to enable the cultivator to give sufficient air to prevent the plants from being drawn up weak, and also to change the volume within, which would soon become stagnated and impure.

AIR.—Next in importance to the regulation of temperature, is that of admitting, at all seasonable times, a supply of fresh air. This is effected by opening the sashes, or by the use of ventilators, built into the front and back walls, at regular distances from each other. On this subject we will only offer the following brief remarks; viz.,— Air confined within a hothouse subject to the action of fire heat becomes so dry, that it is deprived of its capability of affording its share of the food of plants, and as its property is to ascend, as it becomes gradually rarefied, it follows, that the top part of the house is the proper place for its escape. The ventilators, therefore, should be opened, or the top sashes partially let down, where the former are not in use; but this, during winter, need only be done to a limited extent; for air, like all other fluids, will pass with great velocity through a small aperture, particularly when there is a pressure behind it; and the pressure in this instance is caused by the admission of fresh or colder air through the front lights or ventilators. If each, therefore, be opened to the extent of a few inches, a complete exchange will take place, even in a large house, in a very short time. But that this change of air should be as equally distributed through the house as possible, it is requisite that part or all of the top and bottom ventilators be opened at the same time. This, however, is not always attended to, for we frequently see the top ones opened to an unnecessary extent, while the front or bottom ones are left shut. A complete change cannot take place when this practice is followed, unless the house be in a bad state as regards the repairs of the glass. Another great advantage attends the admission of air from the front or lower part of the house, and which ventilators placed in the parapet wall have over the more antiquated mode of opening the upright sashes, as the former are usually placed under or as low as the level of the flue or hot-water pipes; the air, consequently, having to pass close over them, becomes partially warmed before it reaches the plants; whereas, by the latter mode, it enters considerably above them, and falls on the plants, particularly in winter, in too cold a state; and although its effect is less obvious on pines than on tropical plants in general, still it is sufficiently injurious to require correction. It is a mistaken notion with many that the Pine requires a high temperature and little air;—nothing can be more erroneous, for, in common with most plants, it cannot have too much air, provided the temperature is not lowered by its admission.

We have already remarked that ventilation should be attended to as early in the morning as possible, and this the more so in the case of low pits, and when a humid atmosphere is maintained, as the condensed steam falling back from the roof, as well as that arising from the materials undergoing a brisk fermentation below, keeps the foliage damp, and often forms into small globules, which, if not allowed to dry up, particularly where the glass is bad, and speckled or blistered, the sun acting upon them would form lenses, and materially injure the foliage.

SHADING.—That the Pine is, to a certain extent, by nature, a plant of shade, will not be disputed: the finest fruit of it produced in the tropics are those grown in the negroes' gardens, partially shaded by other plants, and perhaps the most successful attempts at its cultivation in Britain have been in houses where they have been partially shaded by vines growing up the rafters, and in pits where a regular system of shading during the heat of summer is attended to. On this subject Speechly has the following judicious remarks, which perfectly agree with our practice; "Succession pine plants do not make half the progress in violent hot weather in the middle of summer, that they do later in the season. In order to obviate the above inconveniences, some persons cover their hothouses in the middle of the day, when the heat of the sun is violent, with bass mats fastened to a rope, which may be moved up and down with great ease. But a better mode, and which is frequently practised, is to cover the glass with a large net, which admits the air to pass freely, and at the same time breaks the rays of the sun, and retards their force, especially if the meshes of the net be not large. But if vines were judiciously trained up the rafters of the hot-house, there would be no need of either of the last-mentioned coverings. The vines should be planted in the front of the hot-house, and not more than one shoot trained to each rafter, part of which should be cut down to the bottom of the rafters every season, by which means the roof of the hot-house may constantly be kept thinly covered with young wood, and by having only one shoot to each rafter, the vine leaves will afford a kindly shade, and never incommode the pines; for the leaves fall, and the vines are pruned, at a season when the hot-house most requires sun." Our practice, however, is to plant our vines outside the house, and to remove the stems as soon as the wood is ripened. Others, however, retain the vines within, and have succeeded for many years in having excellent crops of grapes, notwithstanding the continued high temperature they are kept in. Not only do we think the pines benefited by a partial shade thus afforded them, but we depend upon vines so treated for our earliest supply of fruit, and which is produced at an expense so trifling, that it would be difficult to say that they cost a farthing beyond the mere labour of pruning and thinning.—*Vide* art. VINE.

Pines grown in pits into which vines cannot be introduced, we always shade during the heat of summer, not only when the plants are newly shifted, but afterwards also; and, like Speechly, we approve of nets in preference to mats, and these elevated a few inches above the glass. The most successful cultivators we observed on the continent all adopt shading during summer, and with them it is more necessary than with us, as the sun is more powerful and the atmosphere less clouded. Their materials for shading are rather different from those used in Britain, some having a frame-work of laths, constructed like a trellis, which they place over the glass, while others adopt a more primitive plan, and shade by laying long and flexible branches of birch over both their houses and pits.

In regard to shading, we have elsewhere remarked, that where metallic houses or pits are in use, this branch of culture is the more necessary to counteract the rapidity with which heat is conducted by this material; and we believe the majority of practical gardeners agree with us in this respect. We are aware, however, that there are some who think that there cannot be too much sun-heat to pines, even in our warmest summers. Vines trained under the rafters of pine stoves should be trained either in Speechly's manner, by having a successional young shoot coming forward to succeed that which is producing the current year's fruit, or one stem trained from bottom to top, and pruned into short spurs.

Covering at Nights.—It would be inconvenient to cover the roof of large pine stoves heated by fire-heat; and unless where fuel is very expensive, perhaps it would not pay for the expense of labour and material. But in the case of pits and small houses, whether heated by dung, leaves, or other fermentable matter, we are decidedly of opinion that covering at night during winter should not be neglected. The usual covering is with mats, canvass, litter, straw, or fern. But whatever covering be used, it should be supported by some means or other not less than six or seven inches above the glass, so as to allow a body of air to intervene; and as air is one of the best nonconductors, as has been experimentally proved by Dr. Wells, Leslie, Young, and others, the cold will be excluded or the heat retained much better than if the covering be placed in close contact with the glass.

Shifting and Potting.—Most authors, in treating on this part of pine culture, appear to us to make it, as it were, a periodical matter, and have stated what appeared to them to be the most proper times. We think of this as we do of watering, that it ought to be regulated by circumstances only, and that pines, like all other plants, should be shifted or potted just as they may require it. All plants do not grow alike fast: some, from causes not easily accounted for, will remain long in a stationary state, and some become sickly, even while growing in the same bed. Observation alone can detect this, and when plants are found growing rapidly they will require to be shifted into larger pots, to encourage their growth, while such as remain stationary or appear to be sickly, will require to be examined, and probably disrooted and planted again into smaller pots than those they came out of. Healthy plants may in general be repotted into larger pots with their bulbs entire, while such as are sickly or stationary in their growth will require to be shaken out of the mould, their roots examined, all dead or decayed ones cut close off, and again planted into smaller pots, and plunged into a brisk bottom heat, shaded and kept close from air until they have again made roots, to enable them to take their station with such as are vigorous and healthy.

Pines need never be disrooted while they have plenty of young and healthy roots, but the moment the roots are found to be in a diseased state they should be taken up, and treated as if they were crowns or suckers. "The practice of shaking off the balls of earth, and cutting off the lower roots of pines," as Mr. Loudon justly remarks, "has at first sight an unnatural appearance; and various theorists, and some gardeners, recommend shifting the plants from first to last with their balls entire. On attentively examining the pine plant, however, it will be found that in its mode of rooting it may be classed with the strawberry, vine, and crowfoot, which throw out fresh roots every year, in part among, but chiefly above, the old ones. This done, the old ones become torpid and decay, and to cut them clear away, if it could be done, in all plants of this habit, would no doubt be assisting nature, and contribute to the growth of the new roots. At the same time it is to be observed, that encouraging to an extraordinary degree the production of roots, though it will ultimately increase the vigour of the herb and fruit, will retard their progress;" for, as we have already noticed, the pine makes little progress in the herb while the roots are forming. Upon the practice of shifting pine plants from first to last with their bulbs entire, Speechly has the following rational observations. After expressing his disapproval of the practice, he says, "It is observable that the pine plant begins to make its roots at the very bottom of the stem, and as the plant increases in size, fresh roots are produced from the stem, still higher and higher; and the bottom roots die in proportion; so that if a plant in the greatest vigour be turned out of its pot as soon as the fruit is cut, there will be found at the bottom part of the stem, several inches in length, naked, destitute of roots, and smooth: now, according to the above method [that is, of disrooting,] the whole of the roots which the plant produces being permitted to remain on the stem to the last, the old roots decay and turn mouldy, to the great detriment of those afterwards produced. The first ball which remains with the plant full two years, [by the old practice of shifting with entire balls and a three or four years' course of culture,] by length of time will become hard, cloddy, and exhausted of its nourishment, and must therefore prevent the roots afterwards produced from growing with that freedom and vigour which they would do in fresher and better mould. The old ball remaining after the repeated shiftings, it will be too large when put into the fruiting pot to admit of a sufficient quantity of fresh mould to support the plant till its fruit becomes ripe, which (by the old practice) is a whole year after the last time of shifting."

Pines kept in a healthy and vigorous state of growth, and fruited when from eighteen months to two years old, do not require disrooting unless when the roots have been injured, or the plants have become sickly, in which cases it is absolutely necessary. But with those that are healthy and fruited within the above period it is seldom required, at least as general practice. In shifting the Pine, in all stages of its growth, great attention should be paid to draining the pots well, to allow the superfluous water to pass off freely, and at no time should they be over-potted, as practised by many, from a mistaken notion of saving time. Nothing can be more erroneous than this, for, as we have stated elsewhere, the plant scarcely grows in the herb while the roots are making; it is much better to shift them three, four, or even six times during their growth, than to do this only once or twice, and that into too large pots at a time.

REGULATING THE RIPENING OF THE PINE TO SUIT THE DEMAND FOR IT.—In some families a succession of ripe pines is required throughout the year, that is to say, one, two, or three every week; others require them to come in in greater numbers at particular seasons, either in autumn or spring, as, for example, during the town season, as it is called, which usually falls from the beginning of March to the end of May; others desire to have the greatest supply during the shooting season, which usually falls between the beginning of August and the end of January. To meet these demands requires some consideration on the part of the cultivator, and also a corresponding liberality in the proprietor. The cultivator has to consider the best means of keeping up a proper succession of young plants, so as to have a sufficient number ready to show fruit at a required period, and also to manage so as to start them into fruit without any violent check being given to the plant. The old and too generally adopted method of checking the growth of the Pine by withholding water from it for a considerable period, and the no less erroneous one of reducing the temperature, so as to completely paralyze the vigour of the plant, cannot be too strongly condemned: yet these are the chief means laid down by most authors on gardening, and followed by many otherwise excellent practitioners. The evils arising from this mode are, first, uncertainty in the result; and, secondly, reducing the plant to a state of imbecility at the very period when it should be in its greatest vigour, to enable it to form the rudiments of the future fruit. The starvation system by withholding water was laid down by the late Mr. Sweet, who knew little of the practical department of pine cultivation. His directions on this subject could, of themselves, have done little injury; but when we see an error of this kind promulgated by a quotation from his writings by a name so eminent in pomological matters as that of Mr. G. Lindley, we think it only fair to enter our decided caveat against it, the more so as Mr. Lindley premises his article in *Guide to the Orchard*, &c., by asserting that "One of the best methods, without entering into any lengthened detail of operations, seems to be that recommended by Mr. Sweet." If sufficient attention be paid to the culture of the Pine, so that the roots may have filled the pots at or about the period when it is desired that the plant should show fruit, there will be no occasion for using unnatural measures by checking the growth of the plant. The Pine will in general show fruit when its roots are fully developed, but if shifted at that period it will keep on growing, and in this state it may go on for several years. The most certain method that our own practice sanctions our recommending is, to grow successional pines in low, close pits, heated by leaves or dung; at the period when it is desirable for them to show fruit, if the pots be full of roots and the plants otherwise healthy, they should be then transferred to the fruiting house, in sectional order, say twenty or twenty-five plants at a time, and the periods elapsing between each transfer should be in proportion to the projected consumption. In this way we have succeeded for years in supplying a demand which with us fell between the middle of March and the beginning of June, and from the end of August till Christmas.

Abercrombie gives the following directions for management at this period of their growth, which appear to prove that he was not an advocate for the checking system:—" Keep the plants growing gently, and have the pots in general completely filled with the roots by the time at which you intend to excite them into blossom. From the middle of February till the middle of March, is a good time to have the main crop in flower, as the prospective season is the finest. [In this he is perfectly correct, and for those who wish to have fine fruit in summer and early in autumn, it is the proper season for the pines to show fruit.] About a month before you expect to see the fruit, dress the plants, by taking away two inches in depth from the top of the mould. Twist off some of the lower leaves. Fill up with fresh compost round the stems to the remaining leaves. The bark bed should be revived at the same time, so as to make it lively; but no new tan should be added." If a mild bottom heat be maintained from the period of showing fruit till it has half swelled, the more moderate it be kept afterwards the better, to give ample time for the swelling off of the fruit. M'Phail, on the same subject, makes the following observations, which perfectly coincide with our own opinion: —" It frequently happens that pine plants designed to bear fruit, do not show their fruit early enough in the spring or fore-part of summer to ripen their fruit before winter, when there is not sunshine enough to give the fruit any flavour. This may happen because the plants have not come to a proper growth, or their roots may have been injured by too violent a bottom heat, or by being over-watered, or they may have been shifted too late, or have been put into pots too large for their roots to have filled them before the end of the growing season. To make pine plants show their fruit at an early time in the spring, some authors have recommended cutting off some of the roots at the autumn shifting; but long experience has convinced me that cutting off the roots, or destroying them by any means, instead of making them show fruit, is an effectual means to prevent them from showing fruit till they have again made long roots. The fruit of the Pine-apple is formed probably not less than seven or eight weeks before it appears among the leaves, and if the plant is divested partially or totally of its roots, its growth is stopped till it has made roots of considerable length, when it will grow quickly. And if, before the roots were destroyed, the fruit had been formed in the hidden, secret centre of the plant, the fruit will grow and show itself when the leaves of the plant, excepting those on the stem of the fruit, will make no appearance of growing. This, perhaps, may be the reason which induces some persons to think that cutting off the roots of the plant causeth it to fruit sooner than it would do were the roots suffered to remain. If pine-apple plants intended for fruiting the following year, be shifted late in the autumn into pots which their roots do not fill well before the month of January, they probably will not show fruit till late in the spring or summer months."

From all this, and much more that could be adduced, it appears that the proper period for the Pine to start is, when the pots are full of roots; every endeavour, therefore, should be made to effect this purpose, and if effected, there is no doubt but the plants will show fruit without having recourse to checking their growth by unnatural means. They should be in a proper state to start from five to six months prior to the time it may be required to have ripe fruit. It sometimes happens that plants will show their fruit at too early a season, and also when they show at the proper season circumstances may arise to render it desirable to retard their ripening. "To prevent this," says Speechly, "when the fruit is nearly ripe, some of the plants may be taken out of the stove, and set in a dry, shady place, as, for instance, the stove-shed, where the plants may be set, covered with moistened moss, but no water given them; it must be observed that every one of the plants must be taken into the hot-house again, and set in the tan-bed for a week or ten days before the fruit is cut, to give it a good flavour." In this way we have often kept pines for a month, without any apparent injury to the fruit. The fruit may, even when it is ripe, be kept in good preservation for a fortnight by shaking the plants out of the pots and hanging them up by the stem, with the leaves folded over them; and in cases where the crowns can be dispensed with, if they be removed when the plants are hung up, the fruit will lose less of its weight, and be less deteriorated in flavour. Pines intended to be kept for some time after they have arrived at maturity should be removed from the stove before they become too ripe.

Abercrombie says, (quoting from the *Encyclopædia of Gardening,*) "Contrivances for retarding the fruit are sometimes resorted to, that plants that have started too soon into fruit may have a better season to ripen in, and sometimes in order that a whole crop may not come in at the same time. The former may be provided for by shifting early in spring, or at any time before the fruit has attained half its full diameter; and the latter inconvenience may be thus obviated:—If you perceive the fruit ripening too fast, or advancing too nearly together, set as many plants as you intend to retard, into a dry, airy place, affording both shade and shelter. Give no water as long as you intend to suspend their progress. For the same purpose others may be set out green; while the excitement of these is lowered, they must be kept in a growing state."

Nearly the same directions are laid down by M'Phail, but it would be unnecessary to quote them in this place.

GROWING THE PINE IN BEDS OF EARTH INSTEAD OF IN POTS.—This is a very old practice, lately noticed by several writers in the horticultural periodicals of the present day. We see, however, no advantage to be gained by this mode, over that of growing them in pots in the usual manner. It does not appear from any of the papers we have read on the subject, nor from a case or two where we have seen it practised, that finer or even larger fruit have been produced.

GROWING THE PINE IN MOSS AS A SUBSTITUTE FOR MOULD.— This has been tried in the gardens of the Count Montgelas, near Munich, and also in several other gardens in Germany, but the success attending the plan has fallen far short of what may be daily seen in pine-stoves of the most ordinary description of management in England. What could have induced the projectors of this mode of culture, beyond mere novelty—a commodity dealt largely in on the continent—to substitute moss for mould, is very difficult to divine. The practice, we are inclined to think, is nearly as absurd as that of growing the Pine in water, as stated by William Bastard, Esq., in *Philosophical Transactions* for 1777, to have been practised by him, and, of course, with complete success.

INSECTS.—The Pine, like most other plants, will be attacked by insects, but these attacks must be attributed to bad cultivation; for plants ever so clean, and where there is no visible sign of insects being carried to them, will become thus infested; and these, again, when proper culture is followed, will disappear. Of the natural history or economy of these insects as yet we know but little, for, indeed, till lately, authors have contented themselves by merely pointing out the evils they occasion, and by giving recommendations for their destruction. Several papers have of late appeared in various works where this subject has been treated in a more scientific manner, but the results have not been sufficiently satisfactory to warrant our making quotations from them. The insects to which we particularly allude are the white and brown scaly insects, two distinct species. The latter of these is not found to be very destructive in its effects, nor is it difficult to be brushed off. The former is, however, different, both in its effects and also in the difficulty of getting rid of it. A third, and equally annoying enemy, is the white bug, which has by some been confounded with the white scale, but from which it is totally distinct, both in its appearance and operations. "The natural history of these insects," Mr. Loudon justly observes, "never having been thoroughly investigated, the remedies that have been recommended must be considered more as palliative than as efficient processes. A receipt that might, at a certain season, prove efficacious for one species, will be totally unavailing when applied to another, or even to the same, in a different state of existence. Every insect has an economy peculiar to itself, and that economy we must first study before we can devise any certain method of conquering the evil."

Receipts have been given by Miller, Abercrombie, Kennedy, Speechly, Nicol, M'Phail, Griffin, Baldwin, Muirhead, Hay, Rogers, and others: and suggestions thrown out by Knight and Loudon. The principal ingredients in those receipts are the usual nostrums,—soap, sulphur, tobacco, and nux vomica. How far all these or any of them are efficacious, is difficult to say, or by what means they destroy insect life. For ourselves, we think that a very high temperature, accompanied with a degree of humidity almost amounting to the point of saturation—and if accompanied with ammoniacal gas, so much the better,—is one of the most effectual remedies prescribed. It is well known that the Pine will sustain a temperature of above one hundred degrees without injury, accompanied with a dense steam, if shaded from the sun; now in such a temperature and atmosphere no animal life can long exist. Besides, these insects respire through minute pores, thickly placed over their bodies, and any deleterious matter to enter their bodies must pass through these pores.

No vehicle, therefore, can convey that poison so effectually into them as steam, and it is probable that even steam generated from the purest water will have a sufficiently powerful effect upon them.

The following is a brief abstract of the remedies proposed by the above authors:—Miller proposes to immerse the plants for twenty-four hours in water into which tobacco stalks have been infused, the insects to be then rubbed off with a sponge, the plants washed in clean water, and repotted.

Abercrombie recommends a lather made of sulphur vivum four ounces, soft soap four ounces, mixed with a gallon of water that has been poured, in a boiling state, over a pound of mercury.

Kennedy used four pounds of flower of brimstone, one pound of Scotch snuff, two ounces of the leaves of walnuts dried, ground to powder, and finely sifted. This he applied dry, rubbing it into the stems and dusting it over the leaves.

Speechly gives the following:—In every gallon of water which has been poured, in a boiling state, over a pound of quicksilver, dissolve six ounces of soft green soap. In this preparation dip the plants, after a few of the insects have been brushed off, when it is about milk-warm, for the space of three minutes. A second dipping is recommended, but in this a table-spoonful of sweet oil is to be added to every gallon of the mixture; the plants are then sponged over, to remove any unsightly matter from the leaves, and when dry are potted.

Nicol advises, soft soap, one pound; flowers of sulphur, one pound; tobacco, half a pound; nux vomica, an ounce, boiled together in four gallons of soft water till it is reduced to three. Into this preparation the plants are to be immersed, and afterwards repotted. He also recommends the same mixture to be used by watering the plants over-head.

M'Phail depends on a powerful moist heat, in which he declares no insect can exist.

Griffin's plan is as follows:—To one gallon of soft rain water add eight ounces of soft green soap, one ounce of tobacco, and three table-spoonfuls of turpentine; this, when mixed together in a watering pot and left for a day or two, is fit for use. He applies it (after it has been passed through a thin cloth) by syringing it over the plants. For small plants he recommends shaking them out of the pots, and immersing them in the liquor; when dry, to be again potted.

Baldwin recommends the steam of hot fermenting horse dung, which he obtains by making up a bed of it fresh from the stable. Over this he lays branches of trees, or faggots, and upon them places the pine plants, with their roots uppermost, and covers the whole with double mats, to keep in the steam. In this state the plants remain for one hour, when they are taken out and washed in a tub of cold water, and afterwards, when dry, are potted. He asserts that plants grown in beds or pits heated by linings of hot dung, are never attacked by these insects if they are clean when planted.

Muirhead's receipt is only slightly different from Miller's. Instead of tobacco juice he recommends the substitution of flowers of sulphur. He advises the displacing as many of the insects as can be conveniently got at, by rubbing them off with a bit of list mat, fixed on a small stick and dipped in water. The proportion of sulphur is one pound to each garden-pot full of water, and the plants are immersed twenty-four hours. "What share of the cure in either [Miller or Muirhead's ways] may be due to the sulphur, or to the tobacco water," Loudon says, "does not clearly appear; the rubbing off or loosening the insects is evidently important, and it is not unlikely that immersion in simple water, so long continued, may alone be sufficient to destroy them."

Hay's opinion, as given in the *Edinburgh Encyclopædia*, art. *Horticulture*, is to the effect that moderate moisture alone is destructive to these insects. During many years, he regularly watered his pine plants over head with the syringe during the summer months, but only early in the evening; it never injured the plants, and the bug never appeared upon them.

Rogers, after stating "that many remedies have been advertised for the destruction of the different insects which infest pines," used but one, which he always found efficacious. "This was nothing more than sponging the plants with soft water, to a gallon of which was put a pint of tobacco liquor, and, while yet moist, dusting the leaves with a hair-dresser's puff, charged with the following ingredients, in powder:—One pound sulphur vivum, four ounces of camphor, finely powdered, one ounce stone vitriol, ditto, two quarts of soot, finely sifted; the whole to be well mixed, and kept dry in a jar closely corked when not wanted for use. After this application, the plants should be kept in a moist heat for a few days, at the end of which time all the insects will have fled."

Knight and Loudon's suggestions (we quote from *Encyclopædia of Gardening*, last edition,) are as follows:—"Baldwin recommends," says the former, "the steam of hot fermenting horse dung: I conclude the destructive agent, in this case, is ammoniacal gas, which Sir Humphrey Davy informed me he had found to be instantly fatal to every species of insect; and if so, this might be obtained at a small expense, by pouring a solution of crude muriate of ammonia upon quicklime; the stable or cow-house would afford an equally efficient though less delicate fluid. The ammoniacal gas might, I conceive, be impelled, by means of a pair of bellows, amongst the leaves of the infested plants in sufficient quantity to destroy animal life without injuring vegetable life; and it is a very interesting question to the gardener whether his hardy enemy, the red spider, will bear it with impunity." The suggestion of the latter authority is, "One of the simplest, and at the same time most effectual modes of destroying the pine bug, without disturbing the plants, or in the slightest degree deranging the house, is to keep it incessantly filled with steam for several days together, thus raising the temperature considerably above a hundred degrees, which, though in the shade it will not injure the pine-apple, is yet found to be destructive to every species of animal life."

From all that has been quoted above, it will appear that sufficient distinction has not been made between the scale and bug. The latter will, most assuredly, be completely got rid of in a few days, by subjecting them to a high, close, humid atmosphere, which may be accomplished, even in summer, by withholding ventilation, shading the house or pit, and applying copious waterings over the plants, and upon the walls and floors of the house. In winter this may be also effected by the aid of fire heat. The destruction of the white scale is not so speedily accomplished, because it is not only more tenacious of life, but because, if even those that are alive at the time are got rid of by this means, it has little effect upon the thousands of eggs which are deposited under the epidermis of the leaf, and which may be detected, with the aid of a powerful magnifier, when those small protuberances are cut open which are found on the leaves of plants affected with the white scale. The practice, therefore, of displacing them, as recommended by the authors above quoted, is correct, and if this process be carefully attended to, and followed up after the first brood is got rid of, and for some time afterwards, as the young insects emerge from the egg state, and before they have time to reproduce themselves by depositing their eggs, for successive generations, plants may be got completely cleared of them. But all this will be greatly facilitated if a moist and rather high temperature be maintained.

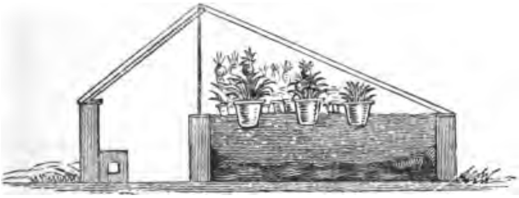
From all we have learned from the various authors we have consulted, and from our own experience, it appears that a dry, arid atmosphere is the principal cause of the existence of these insects. Almost all authors have recommended a humid atmosphere for the growth of the Pine, as being not only the most congenial to it, but also for the prevention or suppression of insects; but, notwithstanding all this, we frequently see pine-stoves kept in a state of aridity far greater than any part of the globe in which vegetation is known to exist.

STRUCTURES CALCULATED FOR THE GROWTH OF THE PINE.—In this department of hot-house architecture, a great variety of forms will be found; some exceedingly simple and well calculated for the end in view; others, complicated in their details, and possessing few or no advantages over the first description of structures. Small pits and fruiting-houses we consider the best, where economy and a constant supply is the main object; besides, small houses present another advantage, too generally overlooked, namely, affording an opportunity of growing the different kinds apart, and pursuing different modes of culture, if it be desirable. Queens and other fast-growing kinds may, in that case, be grown by themselves, and an eighteen-month or two-year system of culture followed. Providences may be grown in a house or pit by themselves, and as the chief object in cultivating them is to have fruit of a larger size, that object will be more conveniently attained than if they were grown in the general collection. Black pines, as they are called, or such as are found to swell their fruit best during winter, may also be cultivated in separate structures, thus affording an early and late supply with the greater certainty.

For growing young pines, until they have attained a size and age to be placed in the fruiting-house, perhaps no better plan can be followed than that of Baldwin's, whose directions for its erection are given in his *Treatise on the Culture of the Ananas*, in the following words:—"Sink your pit three feet three inches deep, and of such length as you may require, and make it sufficiently broad to admit of linings on each side. There should be a good drain at the bottom of the pit, to keep it dry; then set posts, about the dimensions of six inches square, in the pit, at convenient distances (say about the width of the top lights), and case it round with one inch and half deal wrought boards above the surface, and below it with any inferior boards and planks. The dimensions of his succession beds or frames were thirty-nine feet long and seven feet wide, containing two hundred and seventy-three square feet, which held three hundred and fifty suckers from the end of September till the 7th of April."

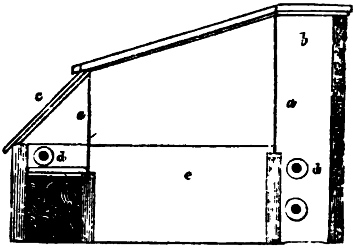
Somewhat similar pits are constructed in Belgium, in the royal gardens at Lacken; but, to resist the great severity of the climate during winter, they were sunk five feet, having thus a deeper bed of fermentable matter; the linings also were covered over at top and under the ground level. The frame work above the ground level was close on both sides of six-inch posts, with their boarding closely jointed, and the space between filled with dry saw-dust, as being a good non-conductor of cold. These pits answered every expectation, but were not boarded close below the surface, only a few rails nailed to the posts, merely to keep the bed up while in the process of making.

Baldwin's fruiting-house is also of the most economical description, and answers every purpose of culture where vines are not grown under the rafters. In his treatise, Baldwin gives scarcely any description of his fruiting-house; he only remarks that the glass should be closely puttied, to keep out the cold air and to retain the warmth. "I like," he says, "to have my plants, both young and old, near the glass, and I think that small stoves, similar to the annexed plan, are best, because they require less fire heat."

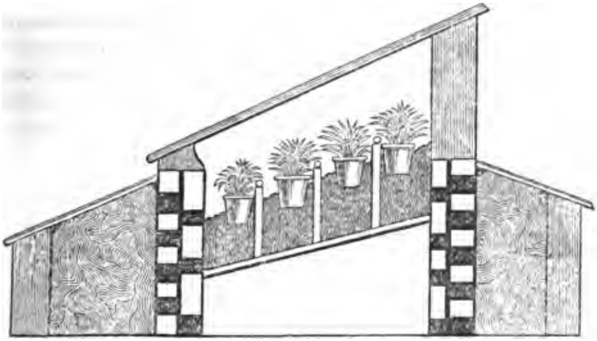


By sinking pits under the ground surface, a great saving of heat is made; but this can only be advantageously done when the subsoil is perfectly dry, or capable of being rendered so. But in accommodating ourselves to circumstances we can, in general, surmount many obstacles, and in this case pits may be built, exactly upon Baldwin's plan, upon the ground level, the linings inclosed within a nine-inch wall, and left so elevated, or the ground may be made up to that level. Where the precaution is not taken of inclosing the linings of all pits and frames, so as to completely protect them from the action of the weather, little dependence can be placed upon a steady temperature, unless with a most extravagant expenditure of dung. The pine-stoves in Kensington gardens are excellent of themselves, and both pines and grapes are grown in them successfully. Pits, to be heated with leaves, or leaves and dung linings, should be about six feet wide, and of any length required. The side and end walls should be of open dove-cote, four-inch brickwork, with piers sufficiently near together to support them. An improvement in these piers, we think, is to construct them so that half of their thickness be on the outside of the pit, the other half within it.

An economical pine pit has been recommended by Mr. Tinker, in *Horticultural Register*, vol. xiv. p. 18, and is described as follows:—"It is built at a light expense; it is forty feet long; a hot-water pipe runs along the front as well as the back, and both descend into the low pipe at the far end from the boiler, and return under the top pipe at the back part; the sloping part, *c*, over the front pipe, is glass; *a*, *a*, are three-quarter iron rods; *b*, flags over head at back; *d*, front and back pipes; *e*, pit, eight feet wide." The annexed cut will explain more fully its principle, which we only disapprove of in having two systems of sashes instead of one.



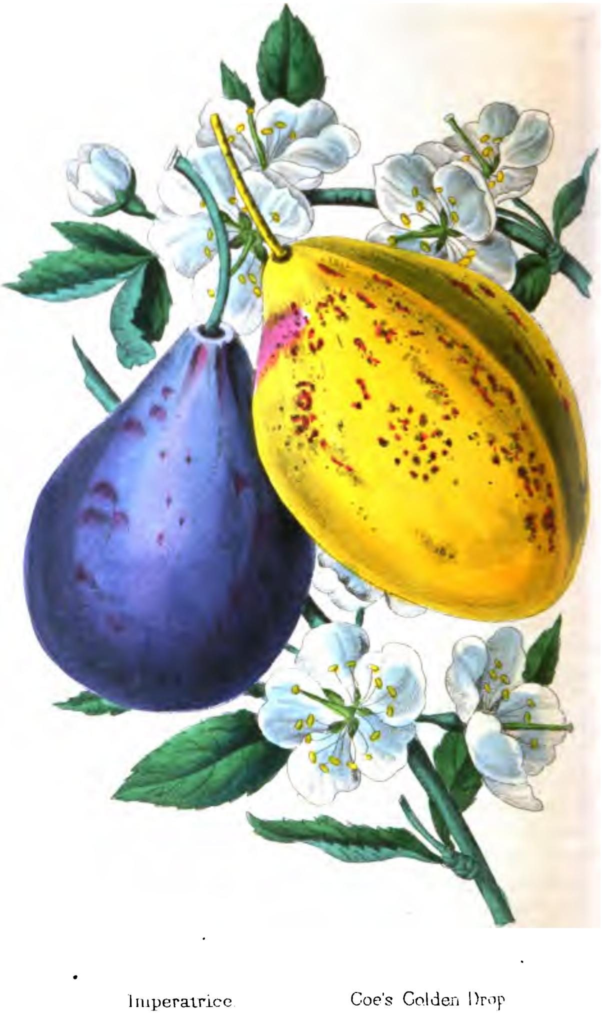
The next plan for an economical pine pit, in which the heat is maintained by dung, that we will here recommend, is one described by J. T. Knowlys, Esq., in the *Horticultural Register*, vol. ii. p. 10, the description of which is as follows:—"The following plan for a pinery, in which pines may be grown and fruited to great perfection, without the aid of fire-heat, is also applicable to every purpose of the forcing department,—grapes, strawberries, early melons, and cucumbers: indeed, I would recommend every hot-bed to be formed upon the same plan: its chief advantages are these,—that in the depth of winter a constant and equal temperature may be kept up, that the manure employed is not wasted, but preserved, by being protected from the rain and wind, which carry off most of its fertilizing properties by the washing away, and evaporation of the ammonia contained in it. Another advantage is, that it takes away all that anxiety from the gardener which he naturally feels when he depends upon fire-heat. It may be glazed at a small expense, by using glass six inches by three, with a narrow lap. There are no expensive pipes to pay for, no coals to buy, no flue to clean, and no encouragement given to insects. The manure of four horses is sufficient to keep up the heat of one of these large pits." The annexed cut will explain the principle of this pit better than any description. We will only remark that it is four feet deep, and seven feet nine inches outside measure. An air chamber is placed under the bed into which the pots are plunged. The steam is admitted through tubes into the interior of the pit, on Mr. Knight's plan, and wooden covers are placed over the dung linings, to prevent them from being acted upon by cold or wet weather. The inside walls are built of brick, in the open dove-cote manner, and the outer ones of stone or any local material.



In establishments where display is a consideration, larger houses may be indulged in, and there is little doubt but that pines may be cultivated to great perfection in houses as large as those described by Speechly, as constructed by him at Welbeck, and exemplified in the royal gardens at Kew, in which young plants are grown in the front pit, and the full-grown or fruiting plants in one immediately behind it, under the same roof. In such large houses vines are trained to the rafters, which, when in fruit, have a noble appearance. For all purposes of economy and general use, small houses or pits are to be preferred.

In the culture of Pines, in all stages and in whatsoever description of structure, one thing ought never to be lost sight of, namely, keeping the plants as near to the glass as possible. If this be not attended to, they will be drawn up weak, their leaves long and slender, and when they show fruit, it will be both diminutive and misshapen, and its footstalks will be too slender to support it without being staked, which is a dangerous process in the management of the pines, because, in placing the sticks in the ball, some of the principal roots are liable to be injured, if not cut asunder. Besides, it would require some mechanical skill to support the pine in such a way as to lighten the weight upon the stem without twisting it, or destroying the relative proportion of weight that each part of the stem has to sustain. Of all modes of support, perhaps something in the way of suspension would be the best, but even this will require care in the execution.

PLUMS.



Imperatrice. Coe's Golden Drop

THE PLUM.

The native country of the Plum is supposed to be Asia, but it is now found wild in various parts of Britain, to which it has completely naturalized itself. This fruit has been in a state of cultivation from a very early period, as we find it recorded by the Greek historians that the plums of Syria, Egypt, and Persia, were added to those either native or cultivated in that country. The Romans also collected into Italy all the Plums of the then known world, and appear not to have been ignorant of the art of originating hybrid varieties. Pliny, although otherwise an historian of reputed credit, often dealt in the marvellous when writing on fruits. In lib. xv. cap. 13, he says, that there were a great variety of Plums in Italy, and asserts that the inhabitants of Grenada and Andalusia began in his time to graft Plums upon apple stocks, which were called Apple Plums; others upon almond stocks, which he considers a clever device, as it produced both fruits, the stone being like the kernel of an almond. The plums grafted on nut stocks retained the form of the parent, but partook of the flavour of the stock on which they were grafted. It is difficult to account for such absurdities, but Pliny was not singular amongst the ancients in this opinion; nor is it long since similar notions have been exploded among even modern practitioners.

The earliest account we have met with of the cultivation of the Plum in this country is in Gerard's *Herbal*, where he says that in his garden at Holborn, in 1597, he had "threescore sorts, all strange and rare; there be in other places many more common, and yet yeerely commeth to our handes other not before knowne. The greatest varietie of these rare Plums are to be found in the grounds of Master Vincent Pointer, of Twicknam." Several sorts of Plums were introduced here from Italy by Lord Cromwell in the time of Henry VII., and it is not improbable that during the reign of Henry VIII. some addition may have been made to them also. Hakluyte, in 1582, says, "Of late time the Plum called the Pedrigeneva (our Blue Pedrigon) was procured out of Italy by the Lord Cromwell after his travell." The Gros Damas de Tours (our Great Damask Violet of Tours), as also the Gros Damas rouge de Tours (our Great Red Damask of Tours), were, according to Bradley, brought from Tours, in France; and from a village in the same neighbourhood came the Diapnee rouge (our Mimms plum). The Green Gage is well known to have been brought from the same country, and the same may be said of many others. Important additions have of late years been made to this family, of which the Washington and Coe's Golden Drop may be considered as the most superior.

As an esculent this fruit is stated by Brookes to be less wholesome than agreeable; but, like the pear, it loses its bad qualities by baking. Plums in general are moistening, laxative, and emollient; except the bullaces and sloes, which are astringent. They are cooling, quench thirst, and create an appetite, and therefore agree best with hot constitutions; but they do not suit weak stomachs: in general, however, they may not only be eaten with impunity, but even with advantage, when perfectly ripe, as they tend to keep the body moderately open. In years when Plums are very plentiful, and consequently much eaten, dysenteries generally abound; hence it appears that they ought always to be eaten very moderately, and then they should be quite ripe and sound. "The wild Plum was used in medicine by the ancients, and the bark of the tree is thought to be equal to the Peruvian bark in cases of intermitting fevers."—*Philips.* The Plum is in general considered as unwholesome, particularly in an unripe state; and, according to Professor Martyn, is in that state more liable to produce cholicky pains, diarrhœa, or cholera, than any other fruit of this class. French prunes, which of themselves are an agreeable dried dessert fruit, are particularly useful in costive habits; and, with figs, have been known to relieve in cases where stronger medicines have failed.

It would appear that the majority of our cultivated Plums, excepting those that have been originated in this country, or introduced within these few years back, have reached us from France. Of the sixty-four sorts described by Professor Bradley, not one has other than a French name; and, notwithstanding this long catalogue at so early a period (1757), he concludes his description, at page 339, in the following words: "One might yet mention great variety of Plums, which are frequent enough about Paris; but I shall content myself with those already mentioned, which will furnish a sufficient variety for any garden of the best sorts."

The colour most predominant in this fruit is purple, and hence the poet says,—

> ——— The mealy plum
> Hangs purpling, or displays an amber hue."

In domestic economy this fruit is highly esteemed; preserved Green Gages forming one of the most delicious of conserves. The Damson is well known as a valuable preserve for winter use, and the German Quitch Plum is dried and preserved in immense quantities, both for home consumption and exportation. This plum is but little known in Britain; but is to the German peasant much more useful than the Damson is with us, and supplies him during winter in a variety of forms, particularly in a state resembling jam, as almost a necessary of life. The dried Plums and Prunes which are imported into this country are chiefly from Portugal and Marseilles. A palatable wine is also made from them, either with or without other fruits or ingredients. The fruit of the neglected and wild sloe of our hedges makes an excellent jam; and, to such as cannot obtain other fruit, will be found a valuable substitute. We had the pleasure lately of tasting this fruit so preserved for the first time in the hospitable mansion of Mr. Donald, of Woking.

Connected with the arts, the wood of the Plum is used for many purposes in turnery, cabinet work, and in making musical instruments.

VARIETIES.—Gerard, as we have already noticed, in 1597 possessed threescore sorts; Tusser enumerates ten; Parkinson, sixty; Miller, thirty; Bradley describes sixty-four; Langley describes and figures twenty-eight sorts, and is amongst the oldest authors that alludes to Plums as being of British origin. He notices the Cheston, Fotheringham, and Wentworth Plums; the latter, he says, is so called from being first planted in the gardens of the Earl of Strafford, at Twickenham; and the second, called

6. Morocco. [*Syn.*, Early Morocco, Black Morocco, Black Damask, Early Black Damask, Early Damask, Black Damascus.]—Originated, it is said, in France; but how it has obtained the name of Morocco is uncertain. Size, medium; form, roundish; colour, dark purple, covered with bluish-coloured bloom; flesh, yellowish-green; requires to be well ripened before it is gathered. Young shoots downy and slender. Ripens in the end of July, or beginning of August. Tree, healthy; great bearer, ripening well as a standard tree.

7. Violette Hative. [*Syn.*, Early Violet, Violet.]—One of our oldest cultivated sorts, being in the collection of John Tradescant prior to 1629. Size, small; form, oval; colour, dark purple, thinly covered with azure bloom; stalk, slender, half-an-inch in length; flesh, green, adhering to the stone; tree, healthy, of moderate growth; an excellent and certain bearer, ripening about the middle of August. Langley states it to have ripened with him on the 26th of July, upon a west wall.

8. Cheston. [*Syn.*, Matchless.]—Where, or at what period originated, is not now known. It is, however, conjectured to be of British origin, as we find it mentioned by Langley, in his *Pomona*, at a period when there were few Plums of native growth. Size, small; form, somewhat oval; colour, deep purple; stalk, half an inch in length; flesh, deep yellow, parting freely from the stone; tree, healthy, and an abundant bearer, ripening about the middle of August.

9. Goliath. [*Syn.*, St. Cloud.]—Size, above medium; form, something oval; colour, pale red where shaded, deep red where exposed to the sun, thinly covered with blue bloom; flesh, yellowish, adhering slightly to the stone; tree, hardy; great bearer, ripening well as a standard, and in every way deserving of cultivation.

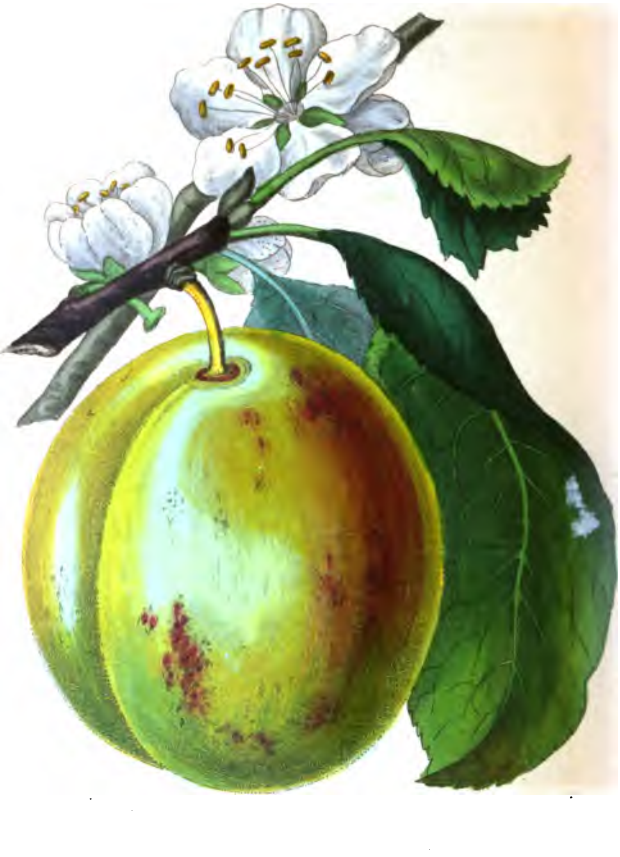
10. Fotheringham. [*Syn.*, Sheen.]—Most likely of British origin, as we find it cultivated by Sir William Temple prior to 1700, at which period few native Plums were known. Size, medium; form, oblong; colour, deep mottled-red next the sun, covered with violet bloom, bright red on the shaded side; flesh, yellowish-green, parting freely from the stone; tree, healthy, hardy, a good bearer both as a standard and espalier; ripens in the south of England about the middle of August.

11. Diaper. [*Syn.*, Red Diaper, Roche-Corbon, Diaprée Rouge.]—Size, above medium; form, oval; colour, pale-reddish, mottled with amber, deeper red next the sun, with russetty specks; tree, hardy, but requiring a wall to perfect the fruit, which has a similar property with the Coe's Golden Drop and Imperatrice, namely, of hanging long on the tree after it is ripe; ripens in September.

12. Imperatrice. [*Syn.*, Blue Imperatrice, Imperatrice Violette.]—Of French origin, but has been long in the English gardens.—Size, small; form, oblong, blunt at each end; colour, rich deep purple, more copiously covered with bloom than any other plum; flesh, adhering to the stone, of a yellowish-green colour; tree, healthy, slender in growth, a great bearer, but requires, even in the best situations, an east or south-east wall; in situations colder or later, a south wall will be required, and on such it will repay the owner better than if planted with peaches, as the fruit when well ripened may be kept for use for a considerable time after it has attained maturity; ripens in October, and continues on the tree with slight covering till the middle of December.

13. Imperial Diadem.—Originated about the beginning of the present century, at Duckenfield, near Manchester. Size, medium; form, oval; colour, light red,

PLUM



Washington.

thinly covered with bluish bloom, through which a few purplish specks appear; flesh, yellowish, separating freely from the stone; ripens about the beginning of September.

14. La Delicieuse. [*Syn.*, Cooper's Large Red American.]—Introduced into this country shortly before 1825, from New Jersey. Size, above medium; form, oval; colour, light yellow, purplish on the sunny side and full of brown specks; flesh, yellow, separating freely from the stone; ripens about the end of September, upon a south or south-west wall, where alone it will grow and bear well. The name is said to have been given by Charles X., of France.

15. Washington. [*Syn.*, Franklin, New Washington.]—Originated in America; and, acccrding to Lindley, was brought into notice in the following manner:—"The parent tree of the Washington Plum, it appears, was purchased in the market of New York towards the end of the last century. It remained barren several years, till, during a violent thunder-storm, the whole trunk was struck to the earth and destroyed. The root afterwards threw up a number of vigorous shoots, all of which were allowed to remain, and finally produced fruit. It is, therefore, to be presumed that the stock of the barren kind was the parent of this. Trees were sent to Robert Barclay, of Bury Hill, in 1819, and in 1821 several others were presented to the Horticultural Society by Dr. Hosack, of New York." From these the whole stock at present in this country has been obtained. Size, above medium; form, ovalish round; colour, dull yellowish-green, having an orange cast on the side most exposed to the sun, the whole covered with a purplish bloom and slightly mottled with crimson dots; flesh, yellowish, parting freely from the stone; tree, vigorous in youth, but not sufficiently hardy to stand as an open standard; an east or west wall, in the south of Britain, and a south wall in the north, is, therefore, the proper situation for this tree. On such aspects it ripens in September, and may be considered one of our very best plums.

16. Wentworth. [*Syn.*, Grosse Luisante, Dame Ambert. From the two latter names it would appear to be of French origin. The former name, we are informed by Langley, was given it from its being first planted in the gardens of the Right Hon. Thomas Wentworth, Earl of Strafford.]—Size, of the very largest description; form, oval; colour, yellow, tinged with green on the shaded side; flesh, yellow, and separating from the stone; tree, healthy, and a good bearer; a very showy fruit, but fit only for preserving.

17. Saint Catherine.—Size, medium; form, oval or oblong; colour, whitish, turning to pale yellow, and tinged with red where most exposed to the sun; flesh, yellow, adhering to the stone; ripens in October, and will shrivel and hang on the tree long after it has attained maturity. It is best adapted for wall training, for although in good seasons it will ripen as a standard, the fruit is small, and sometimes the crop is scanty. The fruit dries well, and without mnch trouble, and suckers from the roots make excellent trees.

18. Apricot. [*Syn.*, Abricotée, Abricotée de Tours.]—Originated at Tours, in France. Size, above medium; form, roundish; colour, yellow, tinged with red, slightly covered with a white bloom; flesh, yellow, parting freely from the stone; tree, healthy, but requires an east or west wall to bring it to perfection.

19. Jaune Hative. [*Syn.*, White Primordian, Catalonian, Prune de Catalogne, Prune de St. Barnabe, Amber Primordian.]—Most probably of Spanish origin, but has long been cultivated in our gardens, as we find it noticed by Trades-

cant, in the time of King Charles I. It does not appear, however, to be quite the same as that described by Bradley under this name, as he says it is "large, white, and very forward, but does not leave the stone;" ours is small, oblong, and separates from the stone; ripens, when planted against a south wall, the earliest of all plums, namely, about the middle of July. Its early ripening is its greatest merit, as well as its being well adapted for early forcing.

20. Wilmot's Early Orleans. [*Syn.*, Wilmot's Orleans, Wilmot's late Orleans.]—Originated in 1809, from seed, by Mr. Wilmot, of Isleworth. Size, rather above medium; form, round; colour, pale red where shaded, dark purple, thinly covered with fine bloom; flesh, yellowish-green, parting freelyfrom the stone; tree, healthy, hardy, and a great bearer, as a standard, espalier, or wall tree; ripens about the beginning of August, and forces well.

21. Precoce de Tours. [*Syn.*, Early Tours.]—Originated in France, but introduced here at an early period. Size, small; form, oval; colour, deep purple, covered with thick blue or violet bloom; flesh, yellowish, parting from the stone; requires a wall, as its chief merit is its early ripening, by the end of July.

22. La Royal. [*Syn.*, Royal, Prune Royal.]—Size, above medium, unless too many be permitted to remain on the tree, as it is apt to set very thick; form, round; colour, bright purplish red, thickly covered with pale violet bloom, through which many brown specks appear; flesh, amber colour, separating freely from the stone; tree, healthy, as a wall-trained tree, upon an east or west aspect; it is much too tender to prosper as an open standard; ripens in August and September.

23. Mimms.—Originated, it is said, many years ago in the garden of Henry Browne, Esq., at North Mimms, in Hertfordshire. Size, very large; form, oblong; colour, light, clear purple, upon a greenish ground; flesh, greenish-yellow, separating freely from the stone; ripens in September, upon an east or west wall.

24. Nectarine Plum. [*Syn.*, Howell's Large, Prune Pêche, Caledonian.]—Size, very large; form, very like a nectarine, from whence the name; colour, purple, covered with fine azure bloom; flesh, yellowish-green, slightly adhering to the stone; tree, hardy, and bears well in the south of England as a standard, but deserves a wall having an east or west aspect, on which it will ripen about the end of July or beginning of August.

25. Purple Gage. [*Syn.*, Reine Claud Violette.]—"The origin of this variety," Mr. Lindley remarks, "is unknown; it must, however, be recent, as it is not mentioned by Duhamel, nor by any of the older French writers, and is even omitted by Noisette, in his *Jardin Fruitier*. It is of very high quality, fully equal to the Green Gage in all respects, and having this superiority—that while the latter is apt to crack in wet summers, and will never keep after being gathered, this, on the contrary, will endure, if the climate be dry, through August and September, even till October, and is scarcely at all disposed to crack." Size, medium; form, round; colour, violet, powdered with light blue; flesh, greenish amber, parting from the stone. This excellent plum deserves an east or west wall, although it will ripen as an open standard.

26. Red Magnum Bonum. [*Syn.*, Imperiale Violette, Imperial, Purple Egg Plum.]—One of the oldest plums in cultivation, being in our gardens previous to 1629. Size, large; form, oval; colour, deep red on the sunny side, with many greyish

specks, palish green on the shaded side; flesh, yellowish, separating from the stone; tree, subject in many situations to gum, otherwise hardy, and producing great crops upon open standards; it is, however, much improved when planted against an east or west wall, in which case it ripens about the middle of September.

27. Orleans. [*Syn.*, Red Damask, Common Orleans.]—This is one of our most common plums, but appears to have been unknown to both Parkinson and Ray. Size, medium; form, round; colour, dark red, ripening to a purplish hue; flesh, yellowish, separating freely from the stone; tree, hardy, and a great bearer either as an open standard, espalier, or wall tree; ripens in August; more esteemed for culinary purposes than for the dessert; takes its name from the part of France so called.

28. White Magnum Bonum. [*Syn.*, Egg Plum, White Mogul, White Holland, Imperial Blanche.]—Size, very large; form, oval; colour, yellow, thinly covered with fine white bloom; flesh, yellow, adhering to the stone; ripens, in favourable seasons and good situations, as an open standard, but requires an east or west wall in most cases, on which it will ripen about the middle of September. This is a well-known plum, and much used for culinary purposes and for preserving; in some uncongenial soils the tree and fruit also is apt to gum. It appears to have been originally introduced from Holland, but at what period is uncertain; neither Langley nor Bradley notices it, and if it had been in England in their time, they could not have overlooked it.

29. White Imperatrice. [*Syn.*, Imperatrice Blanche.]—Size, medium; form, oval; colour, bright yellowish ochre; flesh, whitish, separating freely from the stone; like the Blue Imperatrice, this requires an east or west wall, in good situations, and a south wall in cold and late ones, in which cases it ripens in September.

30. Blue Perdrigon.—An old inhabitant of our gardens, being mentioned by Hakluyt, in 1582, as being procured from Italy. Size, medium; form, oval; colour, deep purple, covered with a fine blue bloom; upon a west or east wall it ripens in August.

PRESERVING, OR CULINARY SORTS.

31. Prune Damson.—Of this there appears to be different kinds, such as the Royal Damson, White Damson, Shropshire Damson, Common Black Damson, &c.; these all resemble each other, and are so well known, that any attempt at description would be superfluous. The Damson takes its name from Damascus, where it is still much cultivated, and grows naturally. It was introduced from thence into Italy, about one hundred and fourteen years before Christ. It is noticed by Pliny, who says that it requires the warmer sun of Syria, which may in a measure account for its not succeeding generally in Scotland. We have known several instances of its being planted in some of the best Scotch gardens, where it has not succeeded to ripen one year in six; and in many situations, favourable to other fruits, where the tree will hardly exist.

32. German Prune. [*Syn.*, Quetsche, Quetzen.]—This sort is very extensively cultivated in Germany, where the lower classes preserve them for winter use as a substitute for butter, and the higher ranks employ them in various preserved states in confectionary. The fruit is also dried in peculiarly constructed ovens, and exported to other countries, under the name of prunes, and is chiefly

sent from Saxony, Moravia, Thuringia, Bohemia, Silesia, and Hungary. This fruit is not yet much known in Britain, and it is probable that it will succeed in Scotland and the colder parts of England, as a standard, better than the Damson or other standard plums.

33. Winesour. [*Syn.*, Rotheram.]—Said to have originated, many years ago, at Rotheram, in Yorkshire. This is by far the most valuable preserving plum in cultivation, and the fruit of it, if properly cured, will keep for two years, and is better than any that are imported from abroad.

34. Brignole. [*Syn.*, Prune de Brignole.]—So called from its growing in great abundance near Brignole, a town in France, celebrated for its prunes, of which this is one of the best sorts.

35. White Bullace.—Cultivated by the cottagers in many parts of England, particularly in Norfolk. They are often preserved by boiling them in sugar, and will keep in this state for a year or more.

36. Kirk's Stoneless Plum.—Some years ago we purchased trees of a plum described by Mr. Joseph Kirk as being without a stone, yet having a kernel, and that it was excellent for preserving. Circumstances have prevented our seeing these trees produce fruit, but the specimen fruit shown by Mr. Kirk was so extraordinary, and wholly new to us, that we notice it here, with a view to drawing the attention of fruit cultivators to the subject. The fruit was small, of an oval form, purplish colour, and exceedingly pleasant to the taste. We do not remember having met with any description of this fruit or any allusion made to a plum without a stone, excepting in an extract from the *Memoirs of the Academy of Sciences at Paris*, for 1735, in Professor Bradley's *General Treatise on Agriculture and Gardening*, published in 1757, in which it is stated that Mr. Marchand showed before the Academy "certain plums, whose kernels had no stone or shell round them; and found that they grew upon a tree which never had produced any others, and which had been known to produce such for twenty years. The kernel of these was covered with a reddish skin, which was tough to the touch, and within that another, which was thinner and white. The kernel had nothing particular in it, except that it carried, on one side of its outer surface, and that always in the same place, a little stony prominence, more or less dented on its convex part; this is usually the twelfth of an inch broad, and two-thirds of an inch long, and has no other appearance but that of a distempered part of the kernel, only that all the kernels have it. The thick, wrinkled skin which surrounds the kernel seems, in that case, to supply the place of the stone or hard shell, and in this also it resembles it—that the pulp of the fruit parts easily and readily from it.

PLUMS USED AS STOCKS FOR OTHER TREES.

37. Brussels.—This is the St. Julien of the continental pomologists, and has been long used in the English nurseries as a stock to work other fruit trees upon.

38. The Pear Plum.—An indigenous variety, also long used for a like purpose. It takes its name from the shape of the fruit, and, according to Rogers and others, is a good stock whereon to work the more tender kind of peaches.

39. The Muscle Plum.—An indigenous tree, but where or when first discovered is not now known. It is very generally cultivated as a stock, particularly for

peaches and nectarines, and takes its name from the colour and shape of the fruit.

40. The Common Sloe, also of the plum genus, has been occasionally used as a stock, and has the property of dwarfing the trees, in the same way that the paradise stock dwarfs the apple. To these may be added the Prune Damson, White and Common Damson, and White Bullace.

The following sorts have been recommended by Rogers for a small garden, viz.:—*Precoce de Tours, *Wilmot's early Orleans, *Green Gage, *Kirk's, and the *Imperatrice. We are surprised, however, that one so well acquainted with fruits, and living on the southern shores of our island, where the climate is excellent, should have omitted *Coe's Golden Drop, *Purple Gage, and *Washington.

Mr. G. Lindley has given a more extensive selection, by adding to the above the following:—*Early Amber, La Royal, *Morocco, *Nectarine, *Violette Hative, Diaper, *Imperial Diadem, *Lucomb's Nonsuch, *Mimms, *Prune Damson, *Wentworth, White Magnum Bonum, *La Delicieuse, *Prune Suisse, *St. Catherine's, and *White Bullace, for the southern and midland counties of England, and those marked * for the northern counties of England and southern of Scotland, to which he adds Early Orleans and Goliath.

For the Highlands of Scotland, the same author recommends the Early Orleans, Fotheringham, Goliath, Kirk's, Morocco, Violette Hative, Coe's Plum, Diaper, Green Gage, Imperatrice, Lucomb's Nonsuch, Orleans, Prune Suisse, Purple Gage, Red Magnum Bonum, and Wentworth.

The following are recommended by Mr. Thompson, in the *Encyclopædia of Gardening*, for a small garden:—Drap d'Or, Green Gage, Kirk's, Washington, Reine Claude Violette, Coe's Golden Drop, Blue Imperatrice, Coe's fine Late Red, Early Orleans, Shropshire Damson, Diamond, and White Magnum Bonum.

We have given the above select lists to show what are in general esteemed the very best sorts; and from them, and those in our descriptive lists, a very complete selection may be formed for any situation. It would be desirable if any certain data could be formed of such as will ripen as standards, but this can hardly be done, as so much depends on local situations. The majority of Plums are cultivated as standards in the south of England, while few are so treated in Scotland, which, as Dr. Neil very justly remarks, "is matter of regret that this branch of fruit culture has not as yet met with due attention in Scotland."

PROPAGATION OF THE PLUM.

The Plum, like most other fruit-bearing trees, is propagated by seeds, layers, budding, grafting, and by suckers.

SEEDS.—This mode of reproduction is seldom practised, except for the purpose of raising stocks on which to work well-known and approved sorts; and stocks so originated are held to be better and more durable than such as are propagated by laying. The sorts usually sown for this purpose are the Muscle, St. Julian (or Brussels), Pear Plum, Magnum Bonum, or similar free-growing sorts. Plums are sometimes raised from seeds, with a view to obtain new or improved varieties. When such is the case, it will be needless to observe that previous attention should be paid to cross-impregnation; for without this, ten thousand trees may be originated before one worth retaining as a superior fruit be obtained. In this way, Coe's Golden Drop, and Fine Late Red, were obtained by a person of that name; and the late Mr. Knight succeeded also in raising several, of which he has given accounts in the *Transactions of the London Horticultural Society*. The following quotation from Mr. Knight's communication respecting the Downton Imperatrice, will show the object and result of cross fecundation :—" This variety sprang from a seed of the White Magnum Bonum Plum, and the pollen of the Blue Imperatrice, from which varieties [Mr. Knight] propagated, on account of having previously observed the fruit of the seedling offspring of the White Magnum Bonum to shrink upon the trees, and dry, without falling off; and thence inferred the practicability of obtaining, with the pollen of the Imperatrice, a large and late Plum, with the firm flesh of the Imperatrice, and the habits of the seedling offspring of the Magnum Bonum. I anticipated," he continues, "a thick and tough skin, such as I had noticed in the seedling offspring of the Magnum Bonum; but I did not think such a skin objectionable, on account of its beneficial operation in defending the flesh both from weather and insects. The plum you receive," he adds, "is, in many respects, such as I hoped to obtain; and it appears capable of retaining its soundness very long, under proper management, though its skin is extremely thin and delicate."

LAYERS.—This mode of propagation is chiefly employed for rearing stocks on which to bud or graft approved sorts, and is principally carried on by nurserymen who cultivate stocks expressly for the purpose.

BUDDING AND GRAFTING.—Both modes are employed, and the stocks preferred are the Brussels and Common Plum: the former for standards, and the latter for dwarfs, although this rule is not absolute. The Brussels stock, if planted out one year, and then cut down to the ground, will, in one season afterwards, send up a clean shoot six or seven feet high, which, if budded the summer following, will make fine trees the year after. Some nurserymen prefer to bud upon the Common Plum at about nine inches from the ground; and these, if planted in proper soil, will send up shoots standard high the first year, but the less vigorous will require a second season to attain that height. Dwarfs are usually obtained by grafting in the ordinary way.

Soil.—The Plum requires a mellow, fertile soil, and seldom succeeds in such as are either too light and dry, or too heavy and wet. It requires, like all other stone-fruit, to be planted on a dry subsoil. Kennedy, an author of high repute, says, "Gravelly, light soils are the best for all kinds of plums: they bear high-flavoured fruit in great quantities: they are not so large as when planted in strong earth, but the quality and richness of the flavour make amends for that deficiency."

Planting.—The season for planting the Plum is the same as that already recommended for the peach, apricot, and almond,—the situation depending on local circumstances, as well as the mode of culture. In climates and situations where the Plum will ripen as a standard, the majority of sorts should be so planted, and the more choice sorts reserved for the walls, which, according to most authorities, should have an east or south-east aspect, which is more suitable to most of them than a south one, on which they (if we except the very late sorts) are apt to shrivel and become dry. Some of the very early ripening sorts should be planted against a south wall to increase their precocity, while all the later sorts, such as Coe's Golden Drop, the Imperatrice, &c., should be also so accommodated that they may attain full maturity in late seasons. The majority, however, should occupy east and west walls in gardens laid out to, or near to, the meridian; and in such as are of irregular form, upon any aspects, excepting due north.

Plums require ample space for training, and therefore should, upon walls under ten feet in height, stand at from twenty to twenty-five feet apart; and on walls of greater or less height, the space should be in proportion. Trees which have been trained for two years in the nursery are to be preferred. Some gardeners, however, prefer trees of one year's growth from the bud, alleging, that when they are older they are apt to canker if upon poor soils, and if on rich ones, that they produce few and too luxuriant branches, and are seldom fruitful. Abercrombie, who is usually very explicit in his directions, says that standards and half standards should be planted from twenty, twenty-five, thirty, or even forty feet apart, and dwarfs generally twenty feet distant. For walls and espaliers, he directs the distance to be fifteen, twenty, or twenty-five feet, stem from stem. Forsyth allows, for walls ten feet high, twenty-four feet, and for twelve feet walls, twenty-one feet; and agrees with us in opinion that they should occupy a wall by themselves, and not be indiscriminately planted amongst other fruit-trees. This sectional mode of planting is applicable to all sorts of fruits, and has many advantages besides the systematic appearance.

In planting Plums, care should be taken that they be not either planted too deep, nor in too rich a soil. If the former error be fallen into, the root will penetrate into a cold or uncongenial subsoil, and produce strong watery shoots, continuing to grow to a late period of the season, and thereby be imperfectly ripened. The strong tap roots should be shortened at planting, and the others spread out in a regular manner near the surface, so that they may enjoy the warmth of the sun heat, as well as a portion of air, which is necessary for the welfare of all fruit-bearing trees. If planted in too rich a soil, they become so luxuriant in growth as to require immoderate pruning to keep them within due bounds, and excessive pruning, in such cases, only tends to aggravate the evil. The old-fashioned practice of placing flag-stones under the roots of Plums is not to be disregarded in most cases where the bottoms of the borders have not been rendered impervious by artificial means, or naturally consisting of a clean alluvial gravel, which is the best of all bottoms, because, while it discourages the penetration of the roots, it allows all superfluous water to pass freely off.

Pruning and Training.—The horizontal and fan modes are the usual forms in which this tree is trained, Forsyth and Harrison preferring the former, and the majority of cultivators the latter. In pruning young, newly-planted plums, Forsyth recommends that the buds be allowed to begin to break before they are cut, and directs heading down, or cutting back to five or more eyes, observing to leave an odd one for the leading shoot; but be it remembered he is modelling his tree for the horizontal mode of training. He also recommends that any shoots which grow too luxuriantly should have their tops pinched off about the beginning of June, the first year after planting, by doing which plenty of young wood will be obtained to fill the bottom of the wall,—a matter of great consequence in all trained trees, and if neglected the first or second year after planting, no art of the pruner can rectify it afterwards, unless the tree be cut entirely over above the graft or bud. The centre or leading shoot should be cut back to the length of from one to two feet, according to its strength:

weak shoots to one foot, and stronger ones to eighteen inches or two feet. During summer, if the leading shoot grow very luxuriantly, it may be topped twice, which will cause it to throw out additional and properly placed lateral branches, which, as they advance in length, are to be nailed to the wall horizontally; and even these, if too strong, may also be topped. Strong and over-luxuriant wood is to be avoided in all trees. The Plum, being naturally prone to luxuriancy of growth, particularly if planted in an over-rich soil, demands our attention in this respect; and if it be neglected, the tree will extend to a great length, quite destitute of young wood or fruit-bearing spurs. [See art. PLANTING, above.]

Harrison, who has carried the theory and practice of horizontal training much farther than the generality of authors or practitioners, gives his reasons to the following effect:—"The sorts of trees, having a natural tendency to become luxuriant, and the training of them in the fan method encourages it, because the natural direction of the sap is to run upwards, and the more erect the branches are, the more is luxuriancy encouraged, consequently the more unfruitful the trees. In order, therefore, to bring such trees to a prolific condition, it is necessary that some means be employed with that express view. This may, in most cases, be effected by training them in a horizontal direction; for when the branches are in this position, it checks the too free motion of the sap, and renders the tree productive of fruit, because the sap cannot proceed so quick in the branches as when they are trained more erect, and thus more time is afforded for the application of the juices in the spurs and buds, which are essential to fruitfulness."

Miller, Abercrombie, Kennedy, and Lindley agree with Forsyth and Harrison in training the Plum horizontally. Miller grounds his objection to the fan method on the fact that this tree is naturally inclined to grow luxuriantly, and objects to shortening the branches, as this operation only causes the tree to grow the stronger, and also because over-pruning produces gum and disease. "Therefore," he says, "the safest method to manage these trees is to lay in their shoots horizontally, as they are produced, at equal distances, in proportion to the length of their leaves, pinching off the points of young shoots where lateral branches are desired, and displacing foreright and irregular shoots, or such as shade the fruit. By thus carefully going over the trees in the growing season, there will be but little to do to them in winter."

Extraordinary luxuriance in Plums is greatly promoted by their being planted in too deep or in too rich a soil, as we have already noticed. It must therefore appear evident that both pruning and training must be regulated by the nature of the soil and habit of the tree; for although horizontal training may be excellent enough in the case of robust-growing trees, it would be injudicious in the case of weakly-growing trees, planted in a poor, dry soil; and in such cases the fan method would be more suitable, and *vice versâ.*

In training the tree after the fan fashion, the rules already laid down for the apricot may be followed, and in some cases an intermediate mode—that of arranging the branches of a fan-trained tree to a lower angle of elevation. Rogers recommends "the fan method as the best, especially on walls, because, as the best fruit is produced on the young wood, an annual supply of this should be laid in; and this is more easily done by fan-training than in any other way." Dr. Niel, in the *Encyclopædia Britannica*, art. *Horticulture*, says, "The fan form is also very commonly followed, and undoubtedly, when there is room, it is the best."

When the Plum is trained to espaliers, no doubt (as in the case also of low walls) the horizontal method is the best; but for walls of ten or twelve feet in height, the fan mode is to be preferred.

Standard Plums require little pruning, if in a proper bearing state. All dead or diseased branches should be cut out, and such as cross each other, and cause confusion, or prevent the free circulation of air. All attempts to alter the natural habit or form of the tree will only tend to its injury. Standard Plums that have been long neglected, and are in a crowded state, may be safely headed over a little way above the graft or bud, when they will in general break strongly, and with a little care in thinning the branches for the first year or two, form fine healthy heads, and afterwards produce abundant crops of fruit.

THINNING THE FRUIT.—This is an operation seldom attended to, although there can be no doubt as to the great utility of the practice. The more common or kitchen sorts perhaps may not repay this extra trouble, but the finer table kinds will be very much improved both in flavour and size, as well as the trees relieved from an unnecessary burden. Plums are apt to set very thickly in clusters: this should be rectified with a pair of sharp-pointed scissors, when the fruit is about the size of large peas; but this thinning must not be considered as complete, as they will require to be gone over again as soon as they have formed their stones: after that period they will not drop off.

INSECTS AND DISEASES.—The insects which are most troublesome to the Plum cultivator are the green and black aphides: these are to be subdued by the common means. In some gardens, a species of coccus attacks the trees, find their way on the fruit, and render it useless. The best means of getting rid of this enemy is to head the trees down, and completely scrape the stock clean, should they have attached themselves to it. Many other remedies have been proposed for the destruction of this insect; but, so far as we know, with no certain success. It abounds in many gardens, particularly in Scotland. The diseases to which the Plum is liable are few, and these proceed from accidental wounds. Excessive pruning and uncongenial soil are the common causes of gum and canker in all trees. The soil should be renewed, if the disease have not made much progress; and the trees must be headed down, if it have become very bad.

FORCING.—It is only in establishments of the first class that Plums are forced, at least to any extent. The most successful practitioners we have met with are the gardeners at Hampton Court, Cumberland Lodge, and Kew. In these gardens the Green Gage, Orleans, and Precoce de Tours, are preferred; and are grown in pots, as well as planted out in the borders. Trees of the two former have existed in the gardens at Cumberland Lodge for many years, and annually produce great crops. The treatment recommended for cherries is also applicable to the Plum; but as the latter is more shy in setting, greater attention is required in its management.

We recommend, in houses already existing, and of the usual form, to grow the trees in pots or boxes; but were a house to be built expressly for this purpose, and the crop not required earlier than the middle of May, we would say, plant the trees upon a wall in the usual manner, and inclose them in a glass structure five feet wide at bottom, and a foot from the wall at the top. This house of course will present an angle to the horizon capable of receiving the rays of light and solar heat during the early spring, and may be heated by hot water, the pipes being laid within a foot of the front parapet wall, which wall should be from a foot to eighteen inches in height, built on arches, to admit the roots finding their way into the border in front.

A structure of this description will be found both economical and useful, as the sashes may be taken off in June, after the fruit is gathered, and placed over a corresponding piece of wall covered with grapes or late peaches, in the southern and midland parts of England; or over the finer late Plums—such as Coe's Golden Drop and Imperatrice—or even some of the finer Flemish or French pears, or late peaches, in Scotland.

The following routine has been laid down by J. Townsend Aiton, Esq., as his practice in the Royal Gardens:—For a crop of plums to ripen in the second week in May, "a house must be covered in early in January, commencing with a temperature of forty-two degrees of Fahr. for the first fortnight, after which it may be gradually raised to fifty-two degrees, at which it may continue until the flowers have made their appearance. During this time, frequent changes of air must be admitted to strengthen the bloom; and the crop will be rendered more certain by keeping the trees in blossom as long as possible, by light shading when necessary; and when the petals begin to fall, gentle dews may be raised from the surface of the mould. As the fruit forms, the thermometer should be raised to fifty-eight degrees: this must be done gradually, as the consequence of a rapid rise may be the casting of the fruit. During the progress of stoning, great care must be taken against sudden variations of the temperature; water should be very sparingly used; and every check given, by fumigation, to the various insects, which will be particularly active at this period. When the fruit is safely stoned, a moderate dressing of rotten manure may be spread on the surface of the mould, the heat increased to sixty-eight degrees of Fahr., and a more liberal supply of water given. After the fruit has attained a full size, and approaches maturity, air must be freely admitted; and water should be given in less quantities, and finally discontinued, a few days before gathering."

THE POMEGRANATE.

ALTHOUGH the fruit of this tree is annually imported in considerable quantity for the supply of the London markets, its cultivation in this country, except as an ornamental plant, has been little attended to. The double-flowering variety being, in general, cultivated, may, in some degree, account for the fruit so rarely appearing in a perfect state in our gardens. That it will ripen its fruit in moderate seasons, in favourable situations, is certain; and, as an instance, (which, by the by, is not a solitary one,) it has ripened abundance of fruit against the wall of a portion of the garden of the Earl of Tankerville, at Walton-on-Thames, for many years past. Certain alterations, however, being now in progress for the erection of a new mansion, it has been necessary to destroy this fine tree. A certain species of regret, which one can scarce help expressing when so interesting a tree falls a sacrifice even to improvement, and a desire to draw the attention of Pomologists to its cultivation, induces us here to include it amongst other fruit-trees in THE ORCHARD.

It is most extensively cultivated on the Continent, wherever the climate will admit of its growth in the open air; and where that is not the case, it is found in all the orangeries from Paris to St. Petersburg, where it is grown in boxes like orange-trees, some of which, in the orangery at Versailles, are said to be between two and three hundred years old. It produces its fruit in October, and hangs on the tree till the following spring, forming a variety with the fruit of the orange tribe, and relieving the monotony of the green foliage.

This is one of the oldest fruit-bearing trees with which history has made us acquainted, and is one of those most frequently mentioned in Sacred Writ. It was, with the vine, one of the fruits discovered by Caleb and Joshua in the promised land, but appears to have been known to the Israelites before that time, as we find it selected as the ornament to the robe of the ephod even while they sojourned in the wilderness. That celebrated artist, Hiram, ornamented the pillars of brass for the porch of Solomon's temple with carvings of the Pomegranate. In the poetic language of Solomon, we have it described as a fruit from which a choice wine was made in his time. He says, "I would cause thee to drink of spiced wine of the juice of my pomegranates." And at a latter period of the Jewish history, the Prophet Joel laments that "the vine is dried up, and the fig-tree languisheth: the pomegranate-tree, the palm-tree also, and the apple-tree; even all the trees of the field are withered."

In Grecian history this fruit has not passed unnoticed. It is described as growing in the famed Elysian Fields; and the story of Ceres entreating Jupiter for the restitution of her daughter Proserpine, whom Pluto had carried off, was promised his request upon condition that she had not tasted food in the infernal regions. Unfortunately she had eaten a few seeds of a pomegranate, which had been told by Ascalaphus, who alone had seen it. The enraged mother turned him into an owl for his unseasonable information!

The Pomegranate appears to be indigenous to Syria, and to have been brought to Rome from Carthage. Pliny wrote largely on this fruit, both on the numbers of varieties, of which he says there are nine, and also on the various uses to which it was applied in medicine and the arts. The flower, he says, was used to dye cloth called Puniceus, and the bark to tan leather with; the flowers, fruit, and bark were all used medicinally, and an excellent drink made by steeping the fruit, cut into pieces, for three days in rain water.

The date of its introduction into England is clearly stated to have been in 1548; and Philips informs us that it is "mentioned among the trees that fruited in the orange-house of the unfortunate Charles I." Gerard reared several plants of it from seed prior to 1597, and notices its medicinal properties. The great Lord Bacon recommends the wine of the sweet Pomegranate for pulmonary complaints; and in default of wine, the newly-expressed juice. He directs it to be taken in the morning, with a little sugar; a small piece of green citron-peel, and three or four whole cloves should be put in the glass in which the expression is made: it should be taken from February till the end of March. Woodville, quoted by Philips, says, "the juice of the Pomegranate is preferred even to that of oranges, in cases of fever. The rind of the fruit and the flowers are the parts directed for medicinal uses; they are both powerful astringents, and have long been successfully employed as such, both externally and internally, for gargles and in diarrhœas, &c. The dose, in substance, is from a drachm to half a drachm; in infusion or decoction, to half an ounce."

VARIETIES.—Pliny, as already noticed, knew of nine; the Parisian nurserymen cultivate eight; and the English, three: of which the sub-acid-fruited, or single-flowering sort, is the best for cultivation as a fruit-bearing tree.

PROPAGATION.—The single-flowering sort is propagated by seeds, cuttings, suckers, layers, grafting, and budding. By seeds, when the quantity required is great, which never can be the case in this country; by cuttings, like other deciduous shrubs or trees, and by suckers and layers to produce strong plants within a short space of time; but, for fruit-bearing plants, the single-flowered species should either be imported from Genoa, or budded or grafted either upon itself, or on any of the other species that can be procured for a stock. The Genoese gardeners bud great numbers of this tree, as they do also of the orange, and carry on a tolerable trade in their exportation.

PLANTING AND SITUATION.—The single and double Pomegranates also are hardy enough to stand in the open air of most parts of the south of Britain; and in such situations flower freely, when the trees have attained a good size, and are of several years standing. But, to plant with the view of obtaining fruit, they should be accommodated with the warmest and most sheltered spot the situation affords, and always against a south or south-east wall.

SOIL.—A strong, rich, loamy soil, is considered the most proper for such trees as are grown within the limits of large pots or boxes; but a lighter and poorer soil upon a dry subsoil will be more suitable to trees planted in the open borders, as having less tendency to cause excess of growth in the shoots, which would be but imperfectly ripened in autumn, to fit them for producing flowers and fruit in the following season. Miller recommends a strong rich soil, in which, he says, " they flower much better, and produce more fruit than if planted on dry poor ground." This, we apprehend, he means for such only as are grown in pots or boxes; certainly in such a soil they would not succeed in the majority of situations in Britain.

PRUNING AND TRAINING.—The flowers proceed from the extremities of the branches produced the same year. It follows, that these should be duly encouraged, and room made for their being laid in close to the wall, by cutting out annually, in early spring, all or most of the weak or superfluous branches of the former year's growth, and shortening the stronger ones left, to cause them to send out young shoots to produce flowers, and that as regularly over the tree as possible. Miller recommends autumnal pruning, which, he says, has a tendency to cause the young shoots to push earlier in the following spring. This is a doctrine which was entertained, particularly in the case of the vine, amongst the gardeners of the last age, and has been revered by some of the present: our own observation has not led us to see any difference in regard to the plant in question; but, as it is an operation which otherwise does not interfere with the growth of the plant, the experiment is worth a trial. The summer regulation of the shoots consists simply in displacing some of the weakest, and removing too luxurious and ill-placed ones, to admit light and sun heat to ripen the fruit, and bring to maturity the branches which afford a supply of young fruit-bearing shoots.

THE QUINCE.

The Quince is a fruit not held in very high esteem amongst the moderns, at least in its natural state; it was, however, differently estimated by the ancients, who considered it as the emblem of happiness and of love. It was dedicated to Venus, and her temples at Paphos and Cyprus were decorated with it, as well as the statues of the gods who led the nuptial processions; and the fruit was eaten by the bride before she entered into the marriage bed. Goropius, a commentator of some repute, asserts that this fruit was the golden apples of the Hesperides, and not oranges, as some pretend, and supports his argument by the fact that the Quince was much esteemed by the ancients, and also that a statue of Hercules had been discovered at Rome, holding in its hand three quinces, which, he says, has allusion to the fable of Hercules having stolen the golden apples from those enchanted gardens. This opinion appears to be strengthened by Pliny's account of the quinces of his time, "There are many kinds of this fruit, [he says,] in Italy, some growing wild in the hedge-rows, others so large that they weigh the boughs down to the ground; some of a green hue, others inclining to gold colour, and called Chrysomela [or golden apples]. All kinds of this fruit [he adds] are in use now-a-days within the waiting or presence chambers of our great personages, where men give attendance to salute them as they come forth every morning;" an act of courtesy, we presume, which would not be very acceptable now-a-days.

The Quince is a native of Austria and other parts of Europe, and was introduced into this country at an early period, as it is mentioned by Gerard as being planted, even in his time, in hedges and fences to gardens and vineyards. It is also mentioned by Tusser, Coles, and Rea, although it is stated in the *Hortus Kewensis* to have been only introduced in 1537. It is supposed to have been brought to this country from the island of Candia.

The medicinal properties of the Quince have been stated to be considerable; and if antiquity of use be a confirmation of this, we may state that Columella considered it as not only yielding pleasure, but health also: Pliny, too, in his twenty-third book, gives a long dissertation on the medical properties of this fruit; and, amongst other cures, ascribed to it when eaten raw, if quite ripe, that it is good for those who spit blood, or are troubled with hæmorrhage; and also that it is a sovereign remedy for the swollen spleen and the dropsy, and that it alleviates the difficulty of breathing in a reclining position. The flowers, he states, either fresh or dried, are beneficial in cases of inflammation in the eyes; and, according to the prejudices of his time, of which he appears to have had his share, he thinks the root acts rather as a charm than as a medicine in scrofulous diseases.

In modern times the medical properties of this fruit have not been altogether disregarded. Philips relates the case of a gentleman in Sussex, who was completely cured of an asthmatic complaint of long standing by the use of quince wine, which was made in the following manner:—"Cut large quinces in quarters, and core them, as the seeds give the wine an unpleasant flavour; grind them in the same manner as apples for cider, and put to every gallon of pummis a gallon of water: let it stand a day or two, and strain it off. Should the pummis smell very strong of the fruit, it will bear a little more water, and to every gallon put three pounds and a quarter of moist sugar, tun it, and stop it quite close in the following March: rack it off, cleanse the cask of the sediment, and put it back again; and in the second year bottle it off."

The juice of the Quince is astringent and stomachic, and is useful in nausea and vomiting. A mucilage prepared from the seeds was formerly much in use, but is now supplied by the ordinary gums.

As an article of domestic economy, the fruit of the Quince is seldom eaten raw, but stewed in pies or tarts along with apples; when the latter are flat, the Quince will give a sharpness to them, and render them more agreeable. Many people, however, greatly dislike both their perfume and taste. Quince-marmalade was formerly much esteemed, and, as old Coles says, "is toothsome as well as wholesome; and, therefore, I cannot blame such gentlemen which are seldom without them in their closets." The Greeks, in the Levant, make them into various comfits, which they offer to their guests as a mark of the highest esteem.

Varieties.—Pliny says there are many kinds; Rea and Coles both mention six sorts; Miller, four; Abercromby, four; Forsyth, three; Rogers, three; Lindley, three, which, he says, are the only hardy kinds known in this country, viz., the Pear-shaped Quince, Apple-shaped Quince, and the Portugal Quince, which last is most esteemed, "and is more juicy, less harsh, and much better for marmalade than any of the others. It is the only sort now cultivated in England for domestic purposes." Hitt says there are several, but recommends the Portugal as the best.

PROPAGATION OF THE QUINCE.—The system of multiplying this tree in most general use is by layers; but they root slowly, remaining two years on the stool, and afterwards gaining standard height tardily. The process of laying is performed during the winter months. The following are the directions given by Lindley on this subject. "When the young shoots are laid down there should be no more than two eyes left above ground, and when these have grown five or six inches long, one of them should be cut clean off, leaving the other to form the plant, which by the autumn will be three feet high. The layers must be taken off the stools as soon as the leaves are fallen, and planted out in rows at three feet apart, and ten or twelve inches from plant to plant in the row. At the end of one or two years they will be fit to bud or graft with the different sorts of pears, for quenouille or for espalier training, or they may be allowed to grow up and form standards for orchard planting. Those, however, which are intended for budding or grafting should be shortened to eighteen inches as soon as quartered out in the rows, which will keep them upright, firm, and steady; but those intended for standards should be staked and tied up as soon as planted, and at the end of three years they ought to be fit to be planted out where they are to remain." These directions are applicable to such as are grown for stocks, on which to graft or bud the different varieties of pears. Rogers says, that "seedlings of either of the three sorts make the best rooted stocks for pears; but require two or three years more than the layers before they are fit for the graft." The Quince may be also propagated by cuttings, but this is seldom practised; and approved varieties, should any appear, may be increased by grafting or budding; but the usual mode is to select handsome-grown plants from the layers, and afterwards treat them lik standard apples or pears.

SOIL.—A soft, moist soil is that in which the Quince attains its greates perfection, and we have always observed it to succeed the best on the alluvial banks of rivers.

PRUNING AND TRAINING.—The Quince is seldom, if ever, trained otherwise than as an open standard. The necessary pruning, therefore, consists in regulating the branches when they are too crowded, or cross each other in a confused manner. Giving the branches a pendulous direction, we think, will be instrumental in bringing them into early bearing, and probably grafting them upon their own stocks may have a like effect. One or two trees are sufficient for the usual consumption of a large family; but in soils and situations very favourable for them, they might be planted in hedge-rows, or in woods, for the production of fruit for making wine.

Forsyth observes, that "quince trees are very apt to have a rough bark, and to be bark-bound; in that case it will be necessary to shave off the rough bark with a draw-knife, and to scarify them when bark-bound." He has promulgated a most ridiculous opinion (which, however, was believed by Miller and some others of his time), namely, that quince trees should not be planted near apples and pears, as the bees and the wind might mix the pollen, and cause the apples and pears to degenerate. This is quite erroneous, and so unphilosophical as scarcely to require refutation.

Raspberry.

THE RASPBERRY.

The Raspberry is a native of Britain, as well as of most parts of central Europe. It is chiefly found in woods and dingles, in rather humid and partially-shaded places. The earliest notice we have of this fruit is by Pliny, who speaks slightly of its merits. He says, "There is a third sort of brambles, which the Greeks call *Idæa,* after Mount Ida. This fruit is smaller than the other brambles, with less thorns on the stem, and these not so sharp or hooked." At what period it was admitted into our gardens is not at present known, but that it was so prior to 1597 is evident from a passage in Gerard, who says it is planted in gardens, although inferior to the blackberry. He calls it Raspis (a name still common in Scotland), and Hindberry; and although he describes the red-fruited kind pretty correctly, he makes no mention of those with white fruit; nor does Tusser, who wrote his *Five Hundred Points of Husbandry* during the preceding reign. In 1568, Dr. Turner says, "The resps are found in many gardens in England: the berries are red." The white therefore appears to be of much more recent origin. Bradley, in 1757, in his *General Treatise on Husbandry and Gardening,* takes no notice of this fruit. Langley, in *Pomona,* 1729, describes three kinds as growing in England, viz., the white, the red, and the purple. He gives a figure of the scarlet raspberry, and observes that "the white and scarlet make a beautiful appearance at table, notwithstanding that the white are not in such great esteem as the scarlet." The fruit appears, by comparing the above remarks with its present state, to have been greatly improved by cultivation.

The medicinal properties of this fruit are considerable; and the wine made from it is recommended by Dr. Short in scorbutic disorders, and when mixed with water, is a cooling draught in ardent fevers. Raspberry syrup, too, dissolves the tartar of the teeth. The Raspberry, like the strawberry, does not undergo the acetous fermentation in the stomach, and is therefore beneficial in gouty and rheumatic cases. The flowers, compounded with honey, were used, in the time of Pliny, as a remedy for watery and blood-shotten eyes; as also in erysipelas, for which purpose it is still occasionally applied.

In domestic economy, the fruit is extensively used for flavouring ices, jams, and jellies. It is also preserved in the two latter forms, as well as made into wine, which is said, by Dr. Short, to be, of all home-made wines, the most delicious to the taste: it lightly and pleasantly stimulates the nerves of the mouth and nose with a most agreeable smell and taste, which proceeds from a mixture of the essential salt and fine oil. The berries are extensively used by distillers for making raspberry brandy, raspberry vinegar, &c.

VARIETIES.—Langley, Miller, and Abercrombie, describe three sorts; Forsyth, eight; Rogers, six; Lindley, twenty-two; and the *Encyclopædia of Gardening*, nine. The nursery catalogues contain a still greater number of sorts.

SELECT LIST OF RASPBERRIES.

1. **Red Antwerp.** [Syn., Large Red Antwerp, Burley, Late-bearing Antwerp, and Knevett's Antwerp, after a market gardener of that name, late of Turnham Green.]
2. **Yellow Antwerp.** [Syn., White Antwerp, Double-bearing Yellow.]—These two are of great merit, and very generally cultivated, and were brought from the neighbourhood of the city after which they are named, where immense quantities of them are grown. It is said to have been introduced by Mr. North, of Lambeth.
3. **Early Prolific.**—Rather earlier than the above, but inferior to them for general crops.
4. **Barnet.** [Syn., Lord Exmouth's, Cornwall's Prolific, Cornwall's Seedling, Cornwall's Red, Cornwall's Large Red.]—Originated with a nurseryman of that name near Barnet, in Hertfordshire, and is an excellent sort. "It is distinguished," says the editor of the *Pomological Magazine*, in which it is figured,

"from the Red Antwerp Raspberry in the canes being much inclined to branch, and in the prickles being long, slender, and reddish. The prickles of the Red Antwerp are deep purple, short, and much dilated. It is very prolific, and ripens early; but not bearing carriage well, it is not cultivated for the supply of the market. It is, however, grown in a number of private gardens, on account of its great excellence. The fruit is of a greater size than in any other variety, except the Red Antwerp, globular, inclining to conical, and of a bright, deep, transparent, purplish red; grains large; flavour extremely rich and pleasant, without much acidity."

5. Double-bearing. [*Syn.*, Red Double-bearing, Perpetual-bearing, Late Cane, and Siberian.]—The merit of this sort is in its producing fruit at a late period of the season, when almost all other small fruits are past. This is not the Double-bearing of Miller, but a very superior sort.

To these we may add, for greater variety, Woodward's Red Globe, Woodward's New Raspberry of Forsyth, Superb, and Cornish; but the five first are quite sufficient for all useful purposes.

PROPAGATION OF THE RASPBERRY.

This is usually effected with little trouble, the old plants sending up annually plenty of suckers from their roots, which should be taken up in autumn or spring, and planted where they are to remain: this operation should not be delayed later than the end of March or beginning of April. New varieties, or indeed a young stock, may be obtained by sowing the seeds as soon as the fruit is ripe, in light, rich soil, and in a cool, rather shaded situation. These will come into bearing the second year, and the young suckers the first year after planting, but not in such profusion as in the second and third years afterwards. A plantation of Raspberries, if properly managed, and planted in a good soil, will continue in a full bearing state for from ten to twenty years, when it should be entirely renewed.

Soil.—Much difference of opinion has existed with regard to the most proper soil for this fruit. All that is required, we think, is a deep, rich, and humid soil; for upon shallow, dry, and poor soils, they neither produce such fine fruit, nor do the plants last so long. The finest crops of Raspberries we have seen were in the nursery of Mr. Shilling, of Northhambro, in Hampshire, where they were planted in a damp corner, under the level of the Basingstoke Canal, and in a turfy, peaty soil. The canes (as the shoots are called) were not less than from eight to ten feet in height, the crop most abundant, and the fruit very large. In the deep alluvial soils about Isleworth, Brentford, and Hammersmith, this fruit attains a perfection seldom seen elsewhere; and from those places is derived the principal supply of the London markets. All authors of any repute approve of a soil of the above description, and most of them recommend a situation either naturally or artificially shaded. The usual place of growth allotted for the Raspberry in gardens is behind a north wall, where the border is in general shaded, and the ground in consequence damp. The only objection we have to such a situation is, that the roots exhaust the border, and deprive those trees which are planted against the wall of their proper share of nourishment.

Planting, &c.—Raspberries are usually planted in compartments by themselves, and this, to a certain extent, is highly proper; for all fruits and vegetables, as far as local circumstances will admit, should be planted as near as possible to each other, which not only gives a garden a more systematic appearance, but saves much time and trouble in its management. On the subject of forming a new plantation, Mr. Lindley has laid down the following directions:—"The raising of a new plantation of shoots is not accomplished by every one in the shortest space of time, and a collection is scarcely ever arranged so as to give all the sorts of which it may consist an equal advantage. In order to do this, it is necessary that the respective heights should be known, to which the different varieties attain: this will enable the planter to arrange them to the greatest advantage. This will be by placing the tallest growers at the back, the middle growers next, and the shortest growers in front. By this mode of arrangement, the shorter and middle growers will receive their due proportion of sun, without it being interrupted by those which attain the greatest degree of elevation. The necessity of such an arrangement as this will be obvious to those who are aware of the advantage to be derived, in wet and cloudy seasons, in having this delicate and tender fruit exposed to the sun, and receiving a free and plentiful admission of air.

"In making such a plantation as this, it will be advisable, if possible, to have the rows extend from east to west. These should be four feet at least from each other; and, supposing one row only can be allotted to each sort, and that six rows are to form the plantation, then the first or north row may be planted with the Cornish, the second with Woodward's Red Globe, the third with Red Antwerp, the fourth with Yellow Antwerp, the fifth with Cane, and the sixth with Double bearing. The stools in the first and second row should be four feet apart, those in the third and fourth three feet and a half, and those in the fifth and sixth three feet. In planting, young suckers should be made choice of, and if in plenty, three of these should be allowed to each stool, placing them in a triangle f six inches apart. If fruit be not wanted the first year, the plants will n considerable strength by being cut down within six inches of the ground, as soon as planted, instead of leaving them three or four feet high, in order to obtain from them a crop of fruit."

In all this we perfectly agree with Mr. Lindley, but would prefer giving them a third more space between the rows and stools, or even a greater distance, and then to crop between the rows with winter greens, spinach, or some similar crop, which would come off by the month of March or April. The market-gardeners round London in many cases plant their Raspberries at even a greater distance, say nine feet between the rows. The plants, in such cases, are trained to long rods, in an espalier form, and the ground cropped between the lines. By training in this way the fruit enjoys abundance of light and sun, are not too much shaded by themselves, and occupy but little space. A few plants of the Early Prolific may be advantageously planted against a south wall, merely for the sake of having a few dishes of ripe fruit for the dessert before the general crop comes in, but in this case they require an abundant supply of water at their roots.

Pruning.—This is a simple operation, and is almost the only one in the whole art of pruning for which specific rules may be laid down. During winter the plants should be gone over, and all old wood, that is, the shoots that produced the fruit of the past season, entirely cut out close to the ground; all the smaller and superfluous young wood should also be removed, leaving only two, three, or four of the strongest and best canes. These require to be fastened to stakes at the time of pruning, to prevent their being broken during winter, and they should also be left at their full length till March or April, when they should be shortened according to their respective strengths, the weaker to three or four feet in length, and the stronger to five or six. This precaution is necessary, for, although the Raspberry is a native of this country, still the cultivated varieties are sometimes liable to be injured by severe frosts, if they are headed back during winter. When the pruning and training are completed, dung the ground well and dig it in. They will require no other care except frequent hoeings, to eradicate weeds, and to destroy all superfluous suckers which may arise beyond what are required for new plantations.

In some parts of the continent, with the view of obtaining large fruit the suckers are all destroyed, and the young wood thinned out as well as the fruit; by that means, larger fruit is obtained, but the plants are rendered useless for future bearing, and are consequently destroyed and fresh plantations formed.

In order to obtain a late crop of this fruit, plants of any of the above orts may be cut down to within a few inches of the ground; they will

THE STRAWBERRY.

THE wild or wood Strawberry, of which there are a red and a white variety, and the original hautboys, are the only sorts of this excellent, and now numerous family that is indigenous to our country, and even these are now by cultivation rendered very superior to their originals. The Strawberry is slightly mentioned by Virgil, Ovid, and Pliny, but neither of them speaks of it as a cultivated plant, nor do they treat of it as if it had been in any request in their day. This is not so much to be wondered at, as even at this time it is little thought of in Italy, or the warmer climates; and in those countries the art of man could scarce render it worthy of great attention.

The types of some of the varieties are natives of France, Germany, and of the north of Europe, others of Chili, Surinam, and various parts of America; temperate or cold climates, however, are those in which it is chiefly found.

The native sorts of this country have long been cultivated in our gardens, but the better kinds have been introduced comparatively of late years, or originated from seeds by cultivators. The earliest notice we have of this fruit as a garden production, is in Tusser's *Five Hundred Points of Good Husbandry*, in which he points out as part of the work to be done in September,

> "Wife, into the garden, and set me a plot
> With strawberry roots, of the best to be got;
> Such growing abroad, among thorns in the wood,
> Well chosen and picked, prove excellent good."

In Gerard's time they do not appear to have been very plentiful, and also that the supply of plants was (as above directed by Tusser) taken from the native woods. He says, "Strawberries do grow upon hills and valleys, likewise in woods, and other such places as bee something shadowie. They prosper well in gardens: the red strawberry everywhere; and the other two, white and green, more rare, and are not to be found save only in gardens." This would leave us to conjecture that

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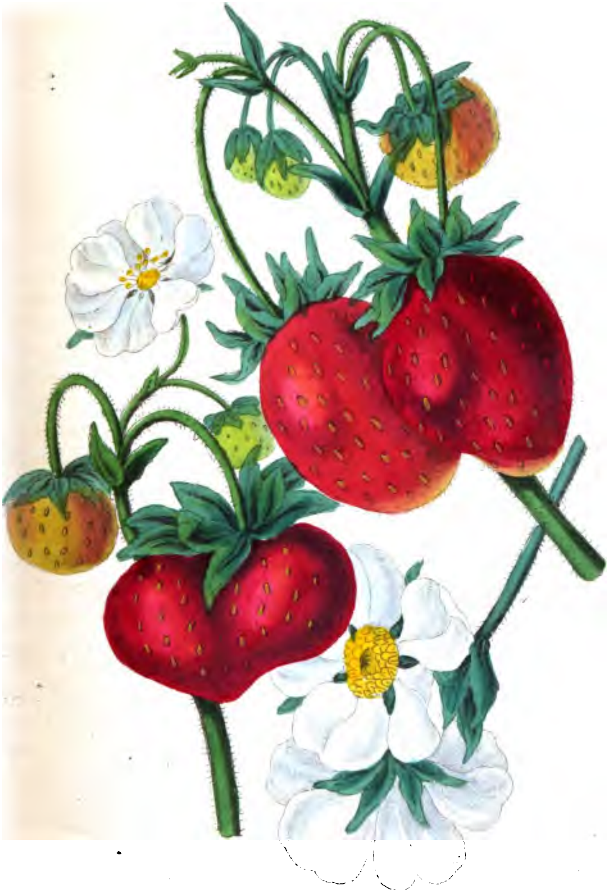

Grove End (reduced one half)   Roseberry.

the white wood was either rare or perhaps not yet discovered, and the plants Gerard had of both might have been obtained from France, where they have been known for ages. In the time of Shakspeare it would appear that they were chiefly gathered from their native habitats. He says,—

"The strawberry grows underneath the nettle;
And wholesome berries thrive and ripen best,
Neighbour'd by fruit of baser quality."

And in another place he says,

"My Lord of Ely, when I was last in Holborn,
I saw good strawberries in your garden there;
I do beseech you send for some of them."

This passage alludes to the Bishop of Ely, who had a garden on the site of Ely Place, Holborn, which was much celebrated for the fruits it produced.

The medicinal properties of the Strawberry are highly spoken of, as the following quotation from Philips will show:—"As a dietetic fruit, the Strawberry affords but little nourishment: the moderate or even plentiful use of it is salubrious, and recommended to those of inflammatory or bilious habits. Boerhaave considers the continued use of this fruit as one of the principal remedies in cases of obstruction and viscidity, and in putrid disorders. Hoffman furnishes instances of some obstinate diseases being cured by Strawberries, and other mild, sweet, subacid fruits, and affirms that he has known even consumptive people cured by them. Linnæus informs us that by eating plentifully of Strawberries every day, he kept himself free from gout. They promote perspiration, and dissolve the tartarous incrustations upon the teeth. Strawberries should be taken sparingly by those of a cold, inactive disposition, where the vessels are lax, and circulation languid, or digestion weak. Many persons are fearful of being poisoned by the saliva of toads and other reptiles which is found on this fruit. M. Haller says, there is no animal in Europe whose saliva can injure unless instantaneously introduced into the blood." The Strawberry is also said to have the property of breaking the stone in the bladder, and some have traced the origin of the Latin name Fragaria from *frango*, "to break," from this supposed property. The fruit consists almost entirely of easily digestible matter, and does not undergo the acetous fermentation.

The uses of the Strawberry in domestic economy are various; it is employed to flavour ices, and is made into a variety of preserves. A de-then produce fruit in August or early in September, and with the Double Bearing sort will prolong the season of this fruit to its utmost limit. The canes which are intended for fruit-bearers the following year may be very much improved in strength if those which have produced first in the current year be removed as soon as the crop is gathered from them: This is a practice very much neglected, but there is no doubt that great advantages may be derived from it.

The Double Bearing sort should have each alternate plant cut down annually, which will ensure a continuance of the ripe fruit till September or October, but it is necessary to plant them in a warm situation, or in one where the autumnal sun may act upon them, to enable them to ripen their fruit at so late a period.

Forcing.—This is seldom attempted in Britain. On the continent, and in Holland in particular, it is carried to a considerable extent. The plants are set in a prepared border, sometimes at the front and sometimes at the back of what is called the low Dutch Pit. The bearing branches or canes are introduced and trained like vines under the glass, while the young shoots arising from the stool are allowed to grow outside. In this way abundant crops are obtained, and also by having plants established in pots or boxes, and set in houses of larger dimensions. The most successful example we have seen of this sort of forcing in England, was at Hylands, the seat of the late P. C. Labouchere, Esq., but we have observed it at many places on the continent conducted with great success. The mode of growing them in large, deep tubs, as practised in this country, is in our opinion the best.

THE SERVICE.

This is a native fruit, and one that cultivation has hitherto not much ameliorated, neither is it held in high esteem, at least in this country. It was, however, differently estimated by the Romans, in Pliny's time, and is so still in some countries. Pliny not only mentions four sorts of it, but says (book xv. chap. xxi.) that Cato would have Service berries preserved: he also gives us an account of preserving them in two different ways. Gerard speaks of the fruit, but is silent as to its being cultivated. Lord Bacon, however, says that in his time the Service tree was considered as an inhabitant of the gardens, and as a farther confirmation of its being at one time a cultivated fruit, we may refer to the twelve engravings of dessert fruit, published in 1733, by Furber, nurseryman at Kensington, where the Italian Service is given for October, and the English maple-leaved Service for November.

There are three sorts of Service tree cultivated in England, but the pear-shaped kind is that most esteemed for its fruit, which is produced on the points of the branches, and when gathered requires to be laid by in the fruit-room to ripen, and in that state is somewhat like the medlar in taste and consistency. According to Rogers, "The true Service cannot be raised from seeds. In this respect it is like our other orchard fruit—not one seedling proving like its parent. Young trees are raised by layers, and these make roots very slowly, as they remain on the stool for two years, at least, before they are fit for removal."

The Service is an exceedingly ornamental tree, and claims a place in shrubberies or the margin of woods, where it will produce its fruit in abundance, but the trees attain considerable size and age before they become fructiferous.

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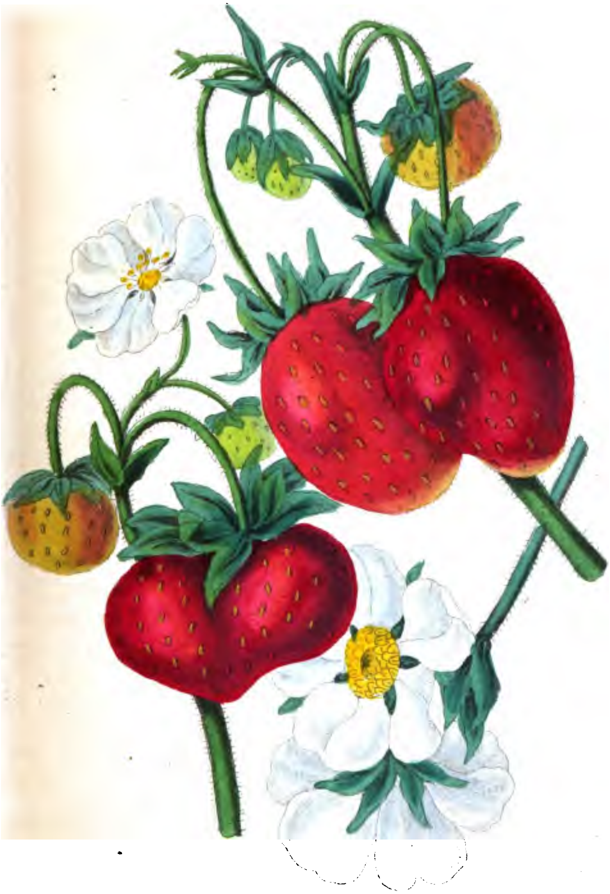


Grove End (reduced one half)　　Roseberry.

means of almost completely banishing from the London market a set of very bad sorts, sold under the name of pines, or sometimes hautboys, consisting chiefly of the Bath Scarlet, Chinese, Surinam, and Dutch of the *Hort. Trans.* These sorts were large and abundant bearers; but to these properties Keen's Seedling combines good flavour, and, consequently, has taken the lead of all others in extensive cultivation, and is likely to do so, at least for a considerable time." Size, very large; form, round or oval, often assuming a cockscomb shape; colour, dark purplish scarlet; pulp, firm, and scarlet; an excellent bearer, and one of the best for forcing, as well as for general purposes.

6. Garnstone Scarlet.—Originated in the garden of — Peploe, Esq., of Garnstone, in Herefordshire, in 1819. Size, large; form, conical, with a short neck; colour, rich scarlet; pulp, scarlet; an excellent bearer.

7. Old Pine. [*Syn.*, Regent's Favourite, Cockscomb Pine, Windsor Pine, Kew Pine, Superior, Barham Down, Blood Pine, Carolina Pine, Scarlet Pine, Old Scarlet Pine, Old Caroline, Common Caroline, Large Caroline, Carolina Pine, North's Seedling, Pyne Hill, Miss Gunning's, Devonshire Scarlet Pine, Shew's Scarlet, Varnished, Bursdorff.]—Introduced from Carolina, many years ago. Size, large; form, conical, with a longish neck, frequently cockscomb shape; colour, bright scarlet; pulp, firm, pale scarlet; an excellent bearer on suitable soils, which should be richer and stronger than for strawberries in general. This is one of our very best sorts, and surpassed in flavour by none, if we except the hautboys. It forces well, and bears carriage better than most others.

8. Black Roseberry. [*Syn.*, Black Round-fruited Roseberry.] — Size, above medium; form, roundish; colour, dark purplish red; pulp, buttery and juicy, and a good bearer.

9. Prolific Hautbois. [*Syn.*, Conical Hautbois, Sir Joseph Banks's, Spring Grove, Double Bearing, Hermaphrodite, Regent's Dwarf, Caperon Royal, Caperon Hermaphrodite, Musk, Sacombe.]—Size, large; form, conical; colour, dull purple; pulp, firm, and greenish; an abundant bearer, and, like all its class, exceedingly high-flavoured and perfumed. The name "haut-bois" is from high-wooded, or high-stalked, or perhaps from this sort being found in the high woods of Bohemia.

10. Large Flat Hautbois. [*Syn.*, Formosa, White and also Bath Hautbois, Lowders, Weymouth.]—Size, large; form, roundish, slightly depressed at the ends; colour, reddish next the sun, pale white where shaded; pulp, greenish white; a most abundant bearer, particularly in stiff soils.

11. Black Hautbois. [*Syn.*, New Hautbois.]—Size, less than the preceding; form, more lengthened than the Prolific; colour, very dark, dingy purple; pulp, whitish; a very abundant bearer, and partaking of all the high qualities of its class.

12. Bostock. [*Syn.*, Rostock, Rostock Pine, Rostock Scarlet, Rostock Seedling, Beattie's Seedling, Caledonian, Cone, New Bath, Byram, Prolific Bath, Montague's, Whitley's Pine, Vernon's, Wellington. The name Rostock originated in the Horticultural Society's gardens, soon after their formation, by one of the men labelling the plants Rostock instead of Bostock, from mistaking the first letter of the name. It was raised in the garden of Francis Tomkinson, Esq., at Bostock, in Cheshire.]—Size, very large; form, nearly round, with a small

neck; colour, dark red next the sun, lighter scarlet where shaded; pulp, pale scarlet, rather hollow at the core; the most productive of all strawberries.

13. Wilmot's Superb.—Size, very large; form, roundish, often cockscombed; colour, pale scarlet; pulp, pale scarlet next the outside, whitish towards the centre. Its great size is its principal recommendation.

14. True Chili. [*Syn.*, Greenwell's French, Greenwell's New Giant, Patagonian.] —Introduced into Europe by M. Trezier, a French engineer, who gave plants of it to M. de Jussieu, Professor of Botany in the *Jardin des Plantes*. It was, however, brought into Britain by Miller, from Holland, in 1727. With the exception of Wilmot's Superb, this is the largest of all strawberries, and although possessing little merit in point of flavour, is a most desirable fruit to cultivate for show. It is also an abundant bearer, but, like all large-growing kinds, requires ample room.

15. American Scarlet. [*Syn.*, Thompson's Roseberry, New Roseberry, Black American, New American, Hudson's Bay Scarlet, Late Scarlet, York River Scarlet, Hudson's Pine, Hoopwood's Scarlet.]—Size, large; form, nearly oval, but more conical; colour, dark, shiny red, changing to a much darker colour when fully ripe, in which state it should be before gathered; pulp, dark scarlet; a good bearer, and deserving of cultivation.

16. Downton. [*Syn.*, Knight's Seedling, Knight's Strawberry.]—Originated with the late Thomas A. Knight, of Downton Castle, in Herefordshire, prior to 1819. Size, large; form, oval; colour, dark purplish red; pulp, scarlet; a good bearer, and very dissimilar to all other strawberries in habit. Rogers says, "that it has been observed of this sort, that for the first and second years it is prolific, but fails to bear afterwards, though the plants are enlarged. From this circumstance a practical lesson is derived, viz., never to keep the plants longer than the second year. Neither does this variety produce many runners; such as are produced must be taken good care of, and let remain where they are produced, till they are sufficiently strong to be removed to the final station. This strawberry seems to thrive better in a moderately light loam, than in that which is moist and heavy. The trusses of fruit are borne on long footstalks, and these, with the weight of the fruit, fall on the ground on the outside of the leaves, and then are liable to be spoiled; to prevent this, the trusses should be propped with, and tied to, short sticks, which must improve the fruit both in flavour and being free from grit."

17. Elton Seedling.—Originated with Mr. Knight, and introduced to the gardening world through the Horticultural Society of London. Size, large; form, oval, but when in vigorous growth assuming a cockscomb shape; colour, dark red; pulp, deep red; a great bearer, and exceedingly valuable as a late strawberry. It should be allowed to ripen fully before it be gathered, else the acidity will be predominant.

18. Coul Late Scarlet. [*Syn.*, Sir George M'Kenzie's Late Scarlet.]—Originated with the gentleman whose name it bears, at his seat in Ross-shire. Size, above medium; form, conical or oval; colour, dark scarlet; pulp, pale scarlet; an excellent bearer, and well worth cultivation on account of the late period of its ripening. Most of the section of scarlet strawberries are early ripening sorts,—this is not, being one of the very latest. Can the cold and late climate in which it originated have any effect in this case? if so, it would open a new field to pomological research.

19. White Alpine. 20. Red Alpine.—These are principally distinguished from the wood strawberries by being conical in form, and larger, and from bearing in succession from June till November, whereas the wood strawberries are globular, smaller, and do not produce fruit so long in succession.

21. White Wood. 22. Red Wood.—It is to the four last that the French gardeners' attention is almost entirely directed, and with great perseverance they contrive to keep up a succession for nearly the whole year. We ought to observe here, however, that, although a pretty constant succession is maintained, the supply is but very limited, considering the labour bestowed on their production. The whole produce of an ordinary French garden for six months, (during the forcing season), would hardly supply an English nobleman's table for six days. We state this publicly, because we know from experience that many unreasonable expectations are entertained by many who have visited the continent, and have formed their opinion only from what they may have seen at the tables of a few of the leading noblesse.

This list might have been extended to a much greater length, but those we have enumerated we consider the best, and if twenty-two varieties of Strawberries do not afford a complete succession of fruit, a greater number would not do more. Indeed we consider it a prevailing evil to cultivate a large collection of any kind of fruit, as a well-selected assortment of the best sorts, that is, a selection of the varieties that are found to succeed best in any particular soil or situation, will be found the most beneficial.

Strawberries have been divided into seven sections or classes by the Horticultural Society of London, a measure that became necessary on account of the great confusion which arose in their nomenclature, from so many new ones being originated, and the practice which too generally prevails of people giving names of some sort or other to every fruit with which they may be unacquainted. An elaborate paper was drawn up in 1824, by Mr. Barnet, by order of the Society, and the result has been most satisfactory. The divisions or classes he has adopted are,—

1. Scarlet-fruited Strawberries, the type of which is *Fragaria virginiana.*
2. Black-fruited do., the type of which being the old Black Strawberry.
3. Pine, (or Pine-apple flavoured), do.
4. Chili do., the type of which is *Fragaria chiloensis.*
5. Hautbois do, the type of which is *Fragaria elatior.*
6. Green-fruited do., the type of which is *Fragaria collina.*
7. Alpine and Wood do., the type of which is *Fragaria semperflorens* and *Fragaria vesca,*—

Each of which forms very separate groups, and at the same time renders the study of the subject much more simple.

PROPAGATION OF THE STRAWBERRY.

Few plants multiply more readily than the Strawberry, either by suckers from the main stem, or by runners, which extend to a considerable length, and strike root at every joint, from which a new plant springs; these, when rooted, are separated from the parent, and either planted out where they are to remain permanently, or are planted into nursery beds, to attain a greater size and strength, which they do in a few weeks' time. They are also increased by seeds, but, unless in the case of the Wood and Alpine sorts, this is rarely attempted, unless the object is to procure new or improved varieties. We have remarked elsewhere, that an improved variety is only to be expected by the process of crossing,—that is, fecundating the stigma of one sort with the farina of another, each of which having some property or other that, if imparted to the young progeny, would render it not only a distinct, but probably an improved fruit. For examble, if high flavour and large size be the object, the parents should possess these characters in a greater or less degree. Indiscriminate fructification will rarely tend to any happy result, as has been demonstrated by Knight, who, desirous of proving this, raised above four hundred varieties, some, he says, "very bad, but the greater part tolerably good, and a few excellent." Seedling Strawberries produce fruit the season following sowing, that is, seeds sown when the fruit is ripe produce a little the next summer, and abundant crops the season following.

The Wood and Alpine sorts are thus raised by many. The seeds are sown in the spring in a bed of light, rich mould, and by July or August the plants will be of a proper size for the setting out. The situation chosen for them is a moderately-shaded border, behind a wall or hedge, where they are set in rows, two feet apart and about twelve inches plant from plant. These varieties differ from all other sorts in quickness of bearing, for no other sort sown in the spring will produce fruit under two years, although many sown in summer (as soon as the seeds are ripe,) will do so. The plant so produced in general lasts only two years, and sometimes only one. The Wood Strawberry, according to the experience of Keen, in *Hort. Trans.*, "is best raised from seeds, which," says he, "I obtained from fruit just gathered, sowing it immediately in a bed of rich earth. When the plants are of a proper size, I transplant them into other beds, where I let them continue till the March following. They are then planted in rather a moist soil, in beds, as the others, each row being two feet apart, and the plants in each row eighteen inches distant, the alley between each bed being three feet wide; in this way I obtain abundant crops of fine fruit." He adds, that he has propagated this Strawberry from runners, but never with such good success as from seeds, particularly if the runners were taken from old roots.

Similar modes are followed on the continent, where this sort is much esteemed, and we believe that the idea of raising them from seed in Britain is borrowed from our neighbours the French.

The view taken by W. G. Lindley in regard to this mode of propagating the Alpine, is, we think, substantially correct, and agrees with our own practice and observation. "Alpine Strawberries," he says, "have been recommended by some to be always raised from seed. I have raised many this way, and I have found myself disappointed in having a portion of them produce inferior fruit to those from which the seeds were obtained. Thus a mixture of Alpines is the result, which, in my opinion, is no ways desirable, as in all cases a crop of the best fruit can never be equalled by a mixture of the best with inferior varieties." Williams of Pitmaston, who has studied the culture of this fruit, admits, that "the fruit of plants raised from seed comes in very well for a late autumn crop, but is certainly inferior in flavour to that produced from transplanted runners." The Wood and Alpine Strawberry may be prolonged in their season of fructifying by planting young plants annually of such as are obtained by runners. Propagating by runners is by far the most common, and at the same time the best method of making new plantations. To effect this, it is only necessary to select the strongest and best young plants as soon as they are fairly rooted, and to take them carefully up without injury to the roots: if the operation be conducted during wet weather, the better. They should then be set in a properly prepared bed, that has been deeply dug, and the greatest care taken not to cut off or bruise the foliage, as is often carelessly done,—and indeed it was formerly the practice to cut off many of the leaves entirely, but nothing can be more barbarous than such a practice. They should be planted at distances in proportion to the size of their leaves and habit of growth—Alpines at six inches apart, Scarlets eight, and Pines and Chilis about ten or twelve inches plant from plant. This may appear a great distance, and to some a waste of room, but there is nothing gained, but on the contrary much lost by planting any trees or plants too close to each other. They may remain in this bed to gain strength till September, or they may with equal propriety remain till March following, when they should be carefully taken up with the planting trowel, with balls at their roots if possible, and planted where they are to remain to produce their fruit. Some cultivators plant them at once in their final situation, but the plants are much improved in strength by being first set out in a nursery bed.

PLANTING.—With respect to the season for performing this operation opinions are considerably at variance, some recommending autumnal and others spring planting. If the plants are strong, and have been selected from the earliest runners, and transplanted into a nursery bed, we are of opinion that it matters little which of these seasons be adopted. The following is the practice of the Rev. Thomas Garnier, who is one of the most successful cultivators of this fruit we have had an opportunity of seeing, and as he has detailed his method in the *Transactions of the Horticultural Society*, we will give it in his own words:—"Early in August, or as soon as the gatherings are over, I destroy all my beds, and proceed immediately to trench, form, and manure them in the manner before directed, to receive the plants for the crop of the ensuing year, taking care to select for that purpose the strongest and best-rooted runners from the old rejected plants. If at this season the weather should be particularly hot, and the surface of the ground much parched, I defer the operation of preparing my beds and planting them till the ground is moistened with rain. Such is the simple mode of treatment which I have adopted for three successive years, and I have invariably obtained from the same spot a great produce of beautiful fruit, superior to that of any other garden in the neighbourhood. Depth of soil I have found absolutely necessary for the growth and production of fine Strawberries, and when this is not to be obtained, it is useless in my opinion to plant many of the best varieties. It is not generally known that I have ascertained the fact that most Strawberries generate roots and strike them into the ground nearly two feet deep in the course of a season. The Pine and Roseberry succeed better than any other in stiff and shallow oils, but they should always be planted in open situations, and not, as is oo commonly the practice, in shady and neglected parts of the garden."

A very excellent paper was drawn up some years ago by Mr. Keen, a ery celebrated cultivator at Isleworth, and published in the *Transactions f the Horticultural Society*, from which we will make the following uotation. In treating of the Pine, which he grows in light loam, he ays, "Though no other kind of Strawberry will bear a strong loam etter than this, it is likewise to be noticed that this is of all others the ost difficult Strawberry from which to procure a good crop. Particular are must be taken that they are planted in open ground; for in small ardens they grow very strong, but seldom bear fruit, in consequence of being so much shaded by standard trees; and I have observed the shade of the walnut tree to be much more injurious to them than others, for under it they seldom bear at all, but run entirely to leaf. In planting the beds of pines I keep the rows two feet apart, and put the plants eighteen inches from each other in the row, leaving alleys three feet wide between each bed; these great distances I find necessary, for the trusses of fruit in my garden ground are frequently a foot long." He considers this sort in point of duration to last only three years, the first year's crop being the best, and diminishing in quantity annually. The Scarlets he treats much in the same way, but, says he, "With respect to the distance for planting the beds of Scarlets, I put each row twenty-one inches apart, and each plant eighteen inches distant in the row, and make the alleys two feet six inches wide." In point of duration he considers it exactly as the last.

In regard to the Hautbois, Mr. Keen considers that they thrive best in a light soil, "and it must be well supplied with dung, for excess of manure does not drive it into leaf like the Pine Strawberry. In planting the beds each row must be two feet apart, and from plant to plant in the rows must be eighteen inches, leaving the alleys between the beds three feet wide." The duration of this sort he considers to be three years. In regard to preparing the soil and beds, he says, "If it be new, and, as is frequently the case, stiff, it should be trenched; but if the bottom spit of soil, as it sometimes happens, be of an inferior quality, I then recommend only a simple digging, placing dung at the bottom, underneath the mould so dug; on the contrary, should the land have been kept in a high state of cultivation, or be good to the full depth, it would be advisable for the bottom spit to be brought up to the top, placing the dung between the two spits. The best way to obtain new plants is by planting out young runners in a nursery, for the express purpose, in the preceding season, for it is a very bad plan to supply a new plantation from old plants. With respect to the time of planting, I have always found the month of March better than any other. Sometimes, when my crops have failed, I have had runners planted in the autumn for the following year, but these have always disappointed my expectations. I plant them in beds containing three or four rows, and the plants in each row at a certain distance from each other, leaving an alley between each bed the distance of the rows, and the plants in the rows, as well as the width of the alleys, depending on the kind of Strawberry planted. The width of the alleys may appear considerable; but I am satisfied, by allowing this space for the workmen to stand on, when they water the plants or gather the fruit, is beneficial; because I have observed, in other persons' grounds, where less space is allotted for this purpose, that great damage is done to the plants and fruit by the trampling of the people."

Lindley prepares the ground for these plants by trenching twenty inches deep, and adding a quantity of half-rotted dung with the first spit, which is in accordance with the above, and to common sense; because the roots of Strawberries penetrate to a considerable depth, and it is at their extremities that they, in common with all plants, take up their nourishment. He plants in beds of four rows each, with alleys from two feet to two feet and a half between the beds. The stronger growing sorts are set fifteen inches apart between the rows and the same distance between each plant. The medium-sized growers are allowed twelve inches each way, and the smaller-growing, such as the Alpine, twelve inches by nine.

The practice of planting Strawberries in single lines as edgings is not altogether to be condemned, and in some small gardens it may be practised on the score of economy. They may also be planted in quarters of large extent in lines varying from fifteen inches to three feet, according to the kinds. This latter is a very common practice where they are grown in large quantities, but in general they are not allowed sufficient space either between the rows or the separate plants in the row.

Shaded and dark situations, although often chosen, are unfavourable for this fruit; they ought to be accommodated with an open, airy, and sunny place, unless those intended for the latest crops, which may be planted in a colder and partially-shaded spot.

Mr. Atkinson, in *Hort. Trans.*, and Messrs. Byers and Brown in *Gard. Mag.*, have stated plans for growing them considerably different from the usual mode. The first of these observed, in a small garden at Chatham, Strawberry beds formed "upon flat ground, each about three feet wide, and between them were trenches about nine inches wide, and four-inch brick walls on each side of the trenches, to keep up the earth on the side of the beds. These trenches were about the depth of two or three courses of bricks laid flat without mortar, and were intended for the purpose of holding water, which was supplied from a pump, when the ground was dry, while the plants were in fruit. By this method a much greater crop of fruit was obtained, and the plants continued bearing much longer than in beds where there were no trenches for water. Brown and Byers grow theirs upon beds elevated in a ridge-like form, the sides forming an angle of forty-five degrees. The latter prefers plants one year old, and sets them at six inches apart. The outer surface of his bed is partially covered with coarse stones or bricks, and the spaces between are filled with mould, in which the plants are set. These beds are renewed annually in the beginning of August, and are reported to afford a greater quantity of fruit upon a given space, and to yield a succession, in consequence of the beds being placed east and west, thus giving them a north and south exposure. A small trench for water is formed along the top, which keeps the roots constantly wet during the season of flowering and swelling their fruit; which last is kept free from sand and earth. Brown's bed is simply a bank of earth, supported in front by a wall nine inches high, and another behind, three feet. The plants are set in rows, each of which is elevated above another, and by placing a row of bricks on edge, the mould is supported like little terraces or steps. These beds are replaced annually, and ripen their fruit from twelve to fourteen days earlier than in the common manner.

Routine of Culture.—After the plantation is once made, the principal attention required is keeping the ground free from weeds by repeated hoeing; watering copiously from the time the plants come into bloom till the fruit is three parts swelled, after which this is discontinued, that the flavour may not be deteriorated. As the fruit ripens, provision should be made to cover the mould between the plants with some convenient littery matter, or to support the fruit trusses by tying them to small stakes. We have found it a good method to cover the spaces between the rows with short heath, which, while it prevents the fruit from being spoiled by sand or earthy matter, does not encourage damp, or shelter slugs and snails, as straw, short grass, or other similar matter does. Mulching the ground between the rows not only preserves the fruit clean, but also benefits the plants by keeping the roots moist, as it prevents too rapid an evaporation, and thus lessens the labour of watering. The practice of Keen, already quoted, is as follows:—"After the beds are planted I keep them as clear of weeds as possible, and on no account allow any other crop to be planted between the rows. The runners I cut when necessary; this is usually three times each season. In the autumn I always have the rows dug between, for I find it refreshes the plants materially, and I recommend to those to whom it may be convenient, to scatter in the spring, very lightly, some loose straw or long dung between the rows. It serves to keep the ground moist, enriches the Strawberry, and forms a clean bed for the trusses of fruit to lie upon; and thus, by a little extra trouble and cost, an abundant crop may be obtained." A short time before the fruit ripens he cuts off the runners to strengthen the root, and after the fruit is gathered, such runners as are made after the first cuttings are removed, as well as the outside leaves of the plants. In autumn, unless the plants appear to be very strong, some dung is laid between the rows, but if they are strong this is not done, as it would make them run too much to leaf, particularly in rich soils.

Some cultivators recommend cutting off the leaves in autumn, while others, with better reason, leave them on, considering the former system as decidedly injurious; among those who have expressed their opinion publicly on this subject is Mr. Young, in *Gard. Mag.*, vol. vii. p. 468, who says that those gardeners are wrong who cut off the foliage after they have borne a crop, because it prevents proper buds from being formed for next year, and also because it deprives the plants of their natural protection during winter. He also disapproves of the practice of digging between the rows in autumn or winter, for he says the fibrous roots are thus cut off, and the plants are prevented from setting out in spring with the same vigour they would do if this practice were not followed.

Knight highly disapproves of digging between the rows of Strawberry plants during autumn, for he says, "by shortening the lateral roots in autumn the plants not only lose the true sap, which such roots abundantly contain, but the organs themselves, which the plants must depend upon for supplies of new food in the spring, must be to a considerable extent destroyed." He also disapproves of taking off the runners, and observes, that if this be done, it must be with judgment and caution, "for every runner is, in its incipient state of formation, capable of becoming a fruit-stalk, and if too great a number of runners be taken off in summer, others will be emitted by the plants, which, under other circumstances, would have been transmitted into foot-stalks. The blossoms, consequently, will not be formed till a later period of the season, and the fruit of the following year will thence be defective alike in quantity and quality."

Forcing.—Few fruits are brought to greater perfection by artificial means than this. From October, and sometimes November, till the following June, is the period when Strawberries cannot be produced from the open borders, but by the assistance of heat and glass houses or pits they may be produced in tolerable perfection during three months or more of that period, that is, during March, April, and May, but in the case of Alpines, often during the winter also. Three methods are in general practised for the preparation of the plants to attain this end. The first is to put them in pots a year or more prior to their being brought into the hot-house,—a practice which was long followed in the royal gardens at Kew and Kensington. The second is, to pot established plants taken from the borders and to force them immediately. This was the original mode in this country, and is still very generally followed on the continent. The third is, to take the young plants produced from the runners as soon as they are rooted, pot them, and force them the following spring. This latter mode was the one practised by ourselves at a time when we forced Strawberries to a considerable extent, and it is also followed by most of the leading fruit-forcers round London. We will, however, as usual, notice the practices of others. Amongst those advocating the former of these methods we may mention Mr. G. Lindley, who, in the months of March or April, pots his Alpines four or five in a pot six inches deep by six inches wide, choosing the young runners of the previous summer's growth. These are kept through the summer plunged in earth in a shady part of the garden, kept clear of weeds and well watered. In October, before the frosty nights set in, they are moved under shelter, as by that time they will be in flower; in November they are removed into the forcing-house, where they produce fruit during winter.

The Roseberry and other Scarlets he pots in May, or early in June, making choice of the late-formed runners. These he sets in pots of the same size, and from four to five plants in a pot. They are treated during summer like the former, only all flowers or runners produced by them during this time are cut off. In January they are placed in the forcing-house. The treatment of the Pine Strawberry is similar to that of the Scarlets, and it is brought into the forcing-house in February or March.

Abercrombie prefers plants two years old, having attained a full bearing state, and M'Phail either takes strong plants up with balls to force immediately, or prepares younger plants by eight or ten months' culture in pots previous to forcing, and the same routine appears to have been followed by Nicol: Mr. Knight prepared his by having them potted a year or more before wanted, or had them lifted at once from the open garden with balls, and forced immediately after.

By far the most usual method, however, now is, and no doubt the best, to select the strongest and best-rooted young runners, as early as possible in the season, to pot them in pots of six or seven inches in diameter, and to set them (not more than half plunged) upon a bed of sifted coal ashes or other dry medium. During summer and autumn they are liberally supplied with water, kept clear of weeds, and set in an open airy situation. In autumn, when frost is likely to set in, a quantity of dry littery matter or fern is laid in the foot-paths, ready to spread over them in very frosty weather. The intention of this covering is to prevent the pots from being broken by the expansion of the frozen ball of earth, and not to shelter the plants in particular, as they are sufficiently hardy, and if in a dry, airy place, will be perhaps benefitted by the low temperature rather than otherwise. When the season for taking them into the forcing-house or pit arrives, which will depend on the time the fruit is wanted and the sorts cultivated, the pots are cleaned, any dead leaves cut off, but not so close as to injure the buds or young leaves; they are then ready for placing in a situation to be slowly excited into growth.

Some cultivators place their young plants, singly into small pots, and shift them afterwards into larger. Others plunge pots between the rows of established plants, and as the runners extend they root into them, and when well established are separated from the parent plant. Some, and with good judgment, after they have filled their whole stock of pots, plant out into a nursery bed a supply of plants which are carefully taken up in spring and used to replenish the pots in which the earliest crops have been fruited. As to the size of pots, or number of plants set in each, this depends greatly on the kind, some requiring more space than others. A reference to what we have advanced in regard to Strawberries in the open air, will be a sufficient guide. We may however observe, that it is better to give plenty of room than to set them too close.

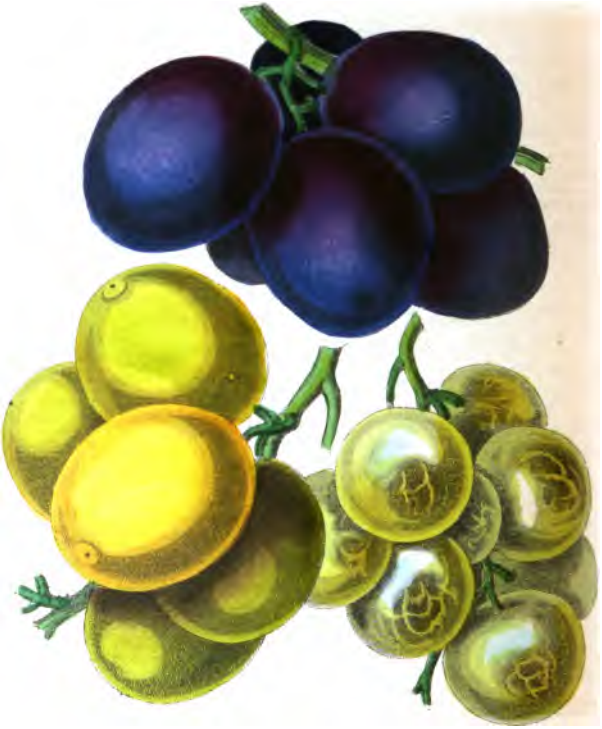
SELECTION OF SORTS FOR THIS PURPOSE.—A reference to our Select List will show the leading forcing sorts. We may observe here, however, that the Alpines and Woods are preferred for winter forcing; the Scarlets for early spring, and the Pines and even Hautbois for the latter forced series, viz., such as immediately precedes the Scarlets in the open borders.

GENERAL ROUTINE.—For the earliest crops it will be necessary to remove the pots into hot-beds or pits, about the end of October, where they must have plenty of air admitted daily, and no more heat than is sufficient to exclude frosts. In this state they should remain till the beginning of December, when the heat may be slightly increased, to cause the buds to swell; when they have begun to develope their young leaves they should be removed to the Strawberry house, or placed on a shelf in the peach or cherry house, where they may enjoy abundance of light and all the sunshine the season affords. When they have set their fruit, they may be removed to shelves in the pine stove, for after this they will bear a considerable temperature. Beginning thus early is, however, striving against the stream, and the produce obtained will be scanty, except in the case of Alpines, compared with that at a more advanced period of the season. M'Phail forced Alpines, or rather prolonged their season, in a very simple manner. "When the weather begins to get cold in September," he says, "Strawberries of the Alpine kinds in pots may be set in a forcing-house or brick frame; and if they be in good health, they will produce fruit for a considerable time. They require only a gentle heat of from fifty to sixty degrees: give them water occasionally, but as there is constantly blossom or fruit on them, they need not be watered over broad-cast; give them plenty of air; they only require protection from heavy rains and cold weather." Nicol begins to force in January, and observes, "Those who force Strawberries to a considerable extent, perhaps a thousand pots, bring them in, in different successions, perhaps a hundred or two at a time." He thinks Strawberries forced much before this time are scarcely worth the trouble.

The general temperature commenced with is from forty to fifty degrees, allowing ten degrees of rise during sunshine. Some prefer setting the pots in pans of water from the first, while others plunge them into a mild bottom heat, in which they are kept till the fruit has set: it is then removed to a higher temperature, say the pine stove, or early vinery, to swell and ripen off. Setting the pots in pans partially filled with water, is well in a high temperature, but in one not exceeding forty or fifty degrees, they will be better set on the dry shelves, at least until the fruit be fully formed. A mild bottom heat, if not too much, excites the plants rapidly, and is a very judicious plan when from any unforeseen event the crop may be required to be forwarded sooner than was at first intended. During the whole period of forcing, Strawberries require plenty of air and light, and never should be allowed to become dry, or they sustain a serious check, particularly while in bloom.

In regard to the structure of the Strawberry house, it should be low, so that the plants may be set close to the glass, and hence pits are preferable, for this purpose, to large houses; but when the latter only can be used, hanging shelves should be arranged for their accommodation.

GRAPES.



Morocco.

Muscat.

Chasselas de Fontainbleau

[Black Morocco Grape.]

THE VINE.

"The Vine, too, here her curling tendrils shoots,
Hangs out her clusters, glowing, to the south,
And scarcely wishes for a warmer sky."

The cultivation of the Vine is of the greatest antiquity: indeed, with the apple and the fig, it is the earliest mentioned of all fruit, and perhaps was taken under the fostering care of man even before them, as we read of Noah's success as a vine grower so shortly after the Deluge as to leave us good ground to conclude that its cultivation was known to the Antediluvians. For, soon after the drying up of the waters he planted a vineyard and made wine, which he could not have done had he been till then ignorant of its culture and use. Throughout the whole Scripture history frequent mention is made of the Vine: it was the emblem of fruitfulness, happiness, and prosperity; and, from the immense quantity of wine consumed, it would follow that the grape was extensively cultivated. Solomon had an extensive vineyard at Baalhamon, which he let for one thousand pieces of silver per annum; and the art of rearing vines from seed was known and practised long before, as we find Moses recommending the Israelites not to sow their "vineyards with divers seeds, lest the seed which thou hast sown, and the fruit of thy vineyard, be defiled." He also gave directions to his people upon the culture of the Vine; from which it would appear that for the first three years they were not allowed to carry any fruit. The produce of the fourth year was dedicated to the Lord and his priests, and not till the fifth year did the husbandman partake of the fruit of his labour.

The heathen nations held the Vine in great veneration, and Hesiod, a cotemporary of Homer, is said to have written a treatise on this plant. The Egyptians and Grecians had vineyards, and manufactured wines: the former of these ascribed the invention of wine to Osiris, and the latter to Bacchus, whom they in consequence elevated to the rank of a Deity as a reward for his discovery; and hence he is still styled the god of vintage, of wine, and of drinkers, and represented as crowned with branches of the Vine.

The Romans had a multiplicity of grapes as early as the time of Pliny. They had both thick-skinned and thin-skinned, some round-berried, others long-berried, and one so lengthened that it was called *dactylides*, from the shape of the grapes being like a finger. Martial gives a high character to the hard-skinned grape, which he considered the best for eating. A vine is recorded to have been then growing at Rome, the fruit of which produced in one year twelve amphoræ, or eighty-four gallons of juice.

The Vine was cultivated by the Romans as an agricultural production, and theri writers on rural affairs have given copious instructions on the subject. In the earliest parts of Roman history we find that wine was only used in the service of their gods, but afterwards man began to partake more freely of it. Young men under thirty, and women all their lifetime, were forbidden to drink wine. Egnatius Macennius killed his wife with a cudgel, having caught her drinking wine out of a tun, for which he was tried by Romulus, and acquitted of murder. Fabius Pictor, in his Annals, reports that a Roman lady was starved to death by her own relations for opening a cupboard which contained the keys of the wine cellar. Cato records that the custom of kinsfolk kissing women when they met was to know by their breath if they had been drinking wine: but these restrictions were removed when wine became more plentiful. It was a saying of Plato, that "nothing more excellent or valuable than wine was ever granted by God to man." One of Martial's Epigrams refers most plainly to a grape-house; but it does not seem to have been calculated to force the crop at an earlier period than the natural one. It is more probable that it was intended for securing a late crop, which may have been managed by destroying the first blossom, and encouraging the Vine to produce a second. The last line of the epigram alluded to states the office of those houses to be for causing the winter to produce autumnal fruits.

The native country of the Vine, like that of most of our cultivated fruits, is now hardly known; but, like some others of them, it is supposed to have originally come from Persia. It is probable, however, that it existed in a natural state over a vast portion of the surrounding countries, where the climate was suitable to its growth. Dr. Sickler has given a curious account of its introduction into Egypt, Greece, and Sicily, from whence it found its way into Spain, Italy, and France, in which latter country it is believed to have been cultivated since the second century.

The introduction of the Vine into Britain is, however, more interesting to us, and it is to the Romans we are indebted for our earliest knowledge of it, though at what particular period is not so certainly known. Some determine its date of introduction to be about ten years after the Christian era, the Romans having at that time full possession of this island. Others think that it was not till about the year 280, when Probus, a great encourager of agriculture in all the Roman provinces, was Emperor. That it was introduced prior to that date is confirmed by the historical fact, that at this time license was granted to the inhabitants of the various provinces to plant vineyards; and the Britons are expressly said by Vopiscus to have been among the number who partook of this decree. Some have attributed its introduction to the Phœnicians, who it is well known traded to the southern coast of Britain for tin, and as they are said to have planted the Vine, which they brought from Palestine, in the isles of the Mediterranean Sea, it is not unlikely that they brought it to Britain also. The venerable Bede says, that vineyards were growing in several places in his time (731). They are particularly noticed in Doomsday Book, and William of Malmsbury, in the twelfth century, commends the county of Gloucester as excelling all other parts of England in the quantity and quality of its wine.

The Vine has been cultivated for the purpose of wine-making in Britain with almost as much success as in France. The Duke of Norfolk had at Arundel Castle, in Sussex, a vinery, from which an immense quantity of excellent Burgundy was made. And the celebrated vineyard at Pain's Hill, near Cobham, in Surrey, was noted for many years for the excellence of its Champagne: it is noticed by Miller and Langley, and more particularly by Barry, in his *History of Wines*. Switzer informs us that Rocque, of Walham Green, made wine for thirty years from his vineyard, which was planted in a common field; and Warner, of Rotherhithe, was also equally successful. From these, and many more instances which might be adduced, it may be taken for granted that very excellent wine might be made from the produce of our climate under judicious management, and a proper selection of soil and situation. It does not appear that artificial means were applied to ripen the grape till 1718, at which period the Duke of Rutland, at Belvoir Castle, applied fire heat under his sloping walls, by which he produced ripe Frontignans in July. These walls were erected at the suggestion of H. Facio, his Grace's tutor, and were afterwards covered with glass, which may be considered as the first grape-houses in England. Switzer, in 1763, appears to be the first author who gave a regular plan for a vinery, and laid down rules for its management. Since his time both the culture of the Vine, and the erection of houses for its growth, have been wonderfully improved.

The most extraordinary vines of which this country can boast are those of the Royal Gardens at Hampton Court, one vine producing annually above two thousand bunches, or nearly two thousand pounds weight; that at Valentine's, in Essex, a like abundant crop; and one in the gardens at Cumberland Lodge, near Windsor, nearly an equal produce. The Hampton Court vine covers an area of nearly one hundred and sixteen square yards, and is reported to be about one hundred years old: one of its branches extending the length of one hundred and fourteen feet from the stem.

LIST OF VINES.

The number of varieties of grape-vines cultivated in this country are upwards of fifty; the names which are to be found in the nursery catalogues even exceed that number. For ordinary purposes we may safely say that half-a-dozen varieties of the very best of these are sufficient, and of these the Muscat of Alexandria and Black Hamburgh may be considered the best when artificial heat is to be applied; and probably the Esperione, Miller's Burgundy, and Black Frontignan the most proper for the open wall.

Tusser, in 1560, appears to have known but two sorts, as he mentions only the red and white grape. Parkinson, who wrote nearly a century after, mentions twenty-three sorts. Ray, in 1688, enumerates twelve sorts, as being then most in request; and to this list Rea, in 1702, adds five more, of which he says the d'Arbois, or Royal Muscadine, Frontignans, and the Blood Red are the fittest for England. Langley describes nineteen sorts, all of which,he says,will ripen against a south wall; Lindley describes sixty-two; *The Encyclopedia of Gardening*, forty-nine; Forsyth, fifty-three; Rogers, twenty-eight, and Speechly, seventy; all of which he had growing in the gardens at Welbeck at one time.

The number of sorts existing in the wine districts on the Continent are still more numerous, which may be accounted for partly from the great length of time this fruit has been cultivated there, the facility with which it is produced from seeds, and perhaps much more from the nature of the soil they are grown in, for it is well known that hardly two vineyards in Italy or France long continue to produce the same sorts unchanged, although originally they may have been to all appearance the same. M. Bosc, we believe, was the first who attempted to arrange and classify the varieties of vines in France; and Hervey, in 1802, published a catalogue of the kinds growing in the celebrated Luxembourg collection, of which the following is an outline of his arrangement. Thirty-seven sorts with black oval fruit; ninety-eight sorts with black and round fruit; forty-four sorts with white oval fruit; seventy-three sorts with white round fruit; five sorts with grey or violet oval fruit; and ten sorts with grey or violet round fruit, making a total of two hundred and sixty-seven sorts. The arrangement drawn up by Mr. Lindley, in *Guide to the Orchard*, &c., is as follows:—Sec. 1. black or blue-fruited; sec. 2, red or purple-fruited; sec. 3, white or yellow-fruited; sec. 4, striped-fruited. That of Mr. Robert Thompson, of the Horticultural Society's gardens, drawn up for the last edition of the *Encyclopædia of Gardening*, and which is by far the most complete and concise, and is accompanied by a copious and valuable list of synonymes, is as follows:—Sec. 1, grapes with round, dark red, purple or black berries; sec. 2, oval, dark red, purple, or black berries; sec. 3, round, white berries; sec. 4, oval, white berries; sec. 5, red, rose-coloured, greyish or striped berries.

The following are the most worthy of cultivation:—

1. Black Frontignan. [*Syn.*, Blue Frontignan, Violet Frontignan, Purple Frontignan, Muscat Noir.]—Introduced into this country by Sir William Temple, in 1654. The name Frontignan, or, as it is more generally but less correctly written, Frontignac, derives its name, according to Lindley, from Frontignan, a town in France, in the department of the Henault, celebrated for its excellent Muscadin wine, generally called Frontignac. Bunches, small, rather long and straggling; berries, of medium size; skin, rather tough, covered with a blue or violet bloom; juice, rich, and of a musky flavour. An excellent vinery grape, and also ripens on warm south walls, in ordinary seasons and situations. Mr. Thompson considers this the same with the Purple and Black Constantia; in this, however, we differ in opinion, at least till an opportunity offers of comparing them together when growing under the same circumstances.

2. Black Tripoli.—Bunches, medium size; shoulders, large; footstalks, long and slender; fruit, globular, large, and sometimes without seeds or stones; colour, very dark purple, almost black; flesh, tender and high-flavoured; leaves, becoming variegated in autumn; an excellent grape, but requires a high temperature.
3. Black Hamburgh. [*Syn.*, Warner's Black Hamburgh, Warner's Red Hamburgh, Red Hamburgh, Purple Hamburgh, Brown Hamburgh, Black Gibraltar, Frankenthal, Frankendale, Black Portugal, Black Lisbon, Black Teneriffe of some authors, Hampton Court Vine, Grove End Hamburgh.]—Originated, or was, perhaps, rather introduced into England, by Mr. Warner, about 1724, from Hamburgh. This is certainly the best of all grapes for ordinary purposes, and is so well known as to require no further description here than to observe, that yearly experience confirms us in the opinion given in the last edition of the *Practical Gardener*, that all the supposed varieties of the Hamburghs, excepting the White, are one and the same, only differing in colour, size, and shape, in consequence of a difference of soil, situation, and culture. It ripens in good seasons against the open south walls, is well adapted for vinery culture, and also for early forcing and the high temperature of the stove. It will keep, if properly ripened, late in autumn, either left attached to the vine, even after the leaves have fallen, or separated from it, and suspended to the ceiling of a well-ventilated, dry chamber. The principal part of the crop of the Hampton Court vine remains on the tree after the leaves have fallen, the house being kept dry and well ventilated; in this way the fruit remains good till the end of January.
4. Black Lombardy. [*Syn.*, West's St. Peter's, West's Black St. Peter's.]—Originally introduced from Lombardy, by Sir William Temple. Bunches, long, rather straggling; berries, medium size; skin, thin and tough; leaves, small, becoming purplish in autumn. An excellent late grape, and keeps well, but requires as much heat to ripen it as the Muscat of Alexandria. It is well adapted for pot culture, and in this way, if ripened late in autumn, it may be kept in good preservation till the early kinds ripen in the spring. This variety was little noticed till about 1816, when Mr. Oldacre published an account of it in the *Horticultural Society's Transactions*, and stated that his practice was, to begin forcing it in April, so as to ripen it in November, by which means he kept it on the vines till March.
5. Black Cluster. [*Syn.*, Burgundy, Black Burgundy, True Burgundy, Small Black Clusters, Early Black, Black Orleans.]—This excellent little grape was introduced from Burgundy, and is there cultivated extensively for wine making. It is well calculated for forcing in pots, as it ripens early and is of small growth; it is also one of the best for the open wall, and in good situations produces immense quantities of highly-flavoured grapes. Bunches, small; berries, thickly set, and of a small size, and dark purple or black colour.
6. Black Muscadine. [*Syn.*, Black Chasselas, Chasselas Noir.]—Originally from France. Bunches, medium size; berries, round, covered with a blueish bloom; flavour, excellent. Ripens on a warm south wall, and, according to the late Mr. Money, upon standards, in his nursery in the Hampstead Road. It is also a good vinery grape, and forces well, even at an early period of the season.
7. Black Prince. [*Syn.*, Sir Abraham Pytche's Black Grape.]—Supposed to have

been brought originally from Spain, but at what period is now uncertain. It is not noticed by Speechly, nor the early writers, and appears to have been brought into notice by the late Mr. Malcolm, nurseryman, who observed it growing in the garden of Sir Abraham Pytche, at Streatham. Bunches, very long; berries, large, and thinly set in the cluster; skin, thick, covered with a fine bloom. Ripens sometimes upon a well-exposed south wall, but perfectly in an ordinary vinery, without much fire heat, and also in the higher temperature of the Pine Stove. A very excellent fruit, and deserves more general cultivation. It is supposed that Speechly's Black Portugal and this may be identically the same; and, according to Rogers, the Cambridge Black grape, described in the *Pomological Magazine,* is not different.

8. Esperion. [*Syn.*, Turner's Black, Hardy Blue Windsor.]—The origin of this excellent, early, and hardy grape, is not well known. It was first introduced to the notice of the Horticultural Society by John T. Aiton, Esq., who purchased it of the late Mr. Williams, nurseryman at Turnham Green, in 1804, and planted it in most of the royal gardens. Bunches, resembling the Black Hamburgh; berries, of various forms; skin, thick, and covered with a rich blue bloom. One of our most valuable hardy grapes, and also well worth cultivation under glass. It ripens to great perfection upon an east aspect, in the royal gardens at Kensington; and, according to the late Mr. Money, upon standards, in the Haverstock nursery.

9. Black Damascus. [*Syn.*, Worksop Manor Grape.]—Imported from Damascus by Edward, ninth Duke of Norfolk. Bunches and berries, large; skin, thin, and of a rich black colour; form, some defect in the parts of fructification, the flowers do not set well, and therefore the berries are often of unequal size. This may, however, be partly remedied, if the flowers be impregnated with those of the Black Hamburgh or any other hardy grape. Requires the temperature of the pine stove.

10. Black Morocco. [*Syn.*, Ansley's Large Oval Black, Rhodes, Horsforth Seedling, Raisin d'Espagne, Raisin de Moroc, Raisin d'Afrique, Le Cœur.]—Bunches, of medium size; berries, very large, if the flower have been perfectly fecundated, which is not always the case, owing, probably, to some imperfection in the parts of fructification, or possibly from an insufficient temperature while in blossom.

11. Grizzly Frontignan. [*Syn.*, Muscat Gris, Grizzly Frontignac.]—Introduced by Sir William Temple, prior to 1654. Bunches, small, almost without shoulders; berries, medium size, thickly set on the branches; flavour, excellent, and when ripened to perfection and beginning to shrivel, certainly one of the richest of all grapes. Although it is said to have ripened on the open walls, it cannot be had in perfection unless grown in a warm vinery or hothouse.

12. Lombardy. [*Syn.*, Flame-coloured Tokay, Red Rhenish, Rhenish Grape.]—Bunches, very large, as also are the berries and leaves; an excellent bearer, and hangs long on the tree after the fruit is ripe; berries, ovalish; colour, pale-red, or flame-coloured. Requires a high temperature.

13. Red Muscat of Alexandria. [*Syn.*, Red Muscat of Jerusalem, Muscat d'Alexandre Rouge, Red Frontignan of Jerusalem.]—This variety succeeds well against open walls about Paris, where it is held in higher estimation than the White Muscat. It is said by Bradley to have ripened in his time against a south wall at Twickenham, but we doubt much if such was the case, as it requires the tem-

perature of a pine stove with us to ripen in perfection. Bunches, large and shouldered; berries, oval and above medium size; skin, thick, of a reddish-coloured-juice, musky and highly flavoured.

14. Wortley Hall Grape.—Originated from seed prior to 1819, at Wortley Hall, in Yorkshire. Bunches resembling the Black Hamburgh, but possessing a slight muscat flavour; berries, large, containing in general but one stone. Requires the temperature of a hot-house.
15. Royal Muscadine. [*Syn.*, White Muscadine of some, D'Arboyce, Chasselas, Chasselas Blanc, Chasselas Dore.]—Great confusion exists between this and the following variety. It would be desirable if cultivators would endeavour to determine from experience upon some settled nomenclature in this case, as they are both excellent grapes. Descriptions of them will be found in Langley's *Pomona, Pomological Magazine, Encyclopedia of Gardening, Lindley's Guide,* Hill, Speechly, Miller, Rogers, Forsyth, Parkinson, Miller, and our *Practical Gardener,* last edition.
16. White Muscadine. [*Syn.*, Common Muscadine, Early White Grape of Teneriffe, Chasselas de Fontainebleau, Malmsey Muscadine.]
17. Syrian. [*Syn.*, Jew's, Syrie.]—This grape has been long cultivated in Britain, and although one of the largest-growing sorts, has had the misfortune to be also one against which the largest share of prejudice has existed. This, we think, is in a great measure owing to its being imperfectly ripened, for when grown in a high temperature, and allowed to ripen sufficiently, it is far from an inferior grape, although certainly of much less value as regards flavour than many others; the large size, however, to which it attains, demands for it a place in large establishments. A bunch of it was produced by Speechley, in 1781, weighing nearly twenty pounds, and measured nineteen inches and a half across the shoulders, and twenty-one inches and three quarters in length. It is supposed to be the same sort brought from the land of Canaan by the two spies, and mentioned in the Book of Numbers. Bunches, irregularly shaped; berries, oval and large; skin, thick and white; flesh, firm and hard, and when well ripened of good flavour. It bears carriage well, and hangs long on the tree after it is ripe.
18. White Frontignan. [*Syn.*, Muscat Blanc, White Frontignac.]—Bunches, of medium size; berries, medium size, round, growing closely together, or set on short foot-stalks, hence they require to be carefully thinned. This is one of the best grapes in cultivation, and adapted either for warm walls, vineries, or pine stoves.
19. White Muscat of Alexandria. [*Syn.*, Jerusalem Muscat, Malaga, Passe-Musqué, Frontignac of Alexandria, Tottenham Park Muscat, Eshcolata Candia, Passe-Musqué blanc, Passe-Longue Musqué, and also the Cannon Hall Muscat, which can only be like the Tottenham Park Muscat, considered as an improved seedling sub-variety of the original.]—Few grapes assume a greater difference than this, when cultivation, soil, and local circumstances are duly considered and allowed for. It is certainly the most valuable grape we have, but requires the temperature of the stove. Bunches, large, irregular in shape; berries, very large, sometimes four inches in circumference; skin, thick; flesh, firm; flavour, excellent. It has also the property of hanging long on the tree after it is ripe, which can scarcely be said to be the case till the berries begin to shrivel. We

may also remark that this grape is too often gathered before it has fully attained maturity.

20. White Sweet Water. [*Syn.*, Dutch Sweet Water, Stillward's Sweet Water, Parel Druyf of the Dutch gardens, and, with the Black Hamburgh, under the names of Frankenthal, Frankenthaler, is the principal varieties that they force.]—Bunches, under the medium size; berries, middle-size, globular, and of a pale-green colour, becoming yellowish-green when fully ripe. Calculated either for the open wall, vinery, or hot-house. An excellent variety.

21. White Nice. It is singular that Lindley should make no mention of this grape in his *Guide to the Orchard*, &c., and also that Speechly, Forsyth, and Rogers are silent on the subject. Bunches, very large; berries, about the medium size, thinly distributed upon the ramifications of the bunch; skin, rather tough; colour greenish, turning yellowish when fully ripened; bears carriage well, and hangs long on the tree after it is ripe. It is altogether one of the noblest grapes we have, and when fully ripened of excellent flavour. The foliage is particularly downy underneath, which, with the large size of the wood and leaves, distinguishes it fully from all other grapes. Bunches of this variety was grown by us while at Claremont, weighing from fifteen to eighteen pounds. It requires the temperature of the stove.

The best grapes for general cultivation, are the Black Hamburgh, Muscat of Alexandria, White and Grizzly Frontignan, White Sweetwater, Black Prince, Esperion, Black Lombardy, Black Damascus, Black Frontignan, Black Morocco, and White Nice, taking them nearly in the rotation above placed.

PROPAGATION OF THE VINE.

The Vine is propagated by seeds, when the intention is to originate new or improved varieties; few, however, comparatively speaking, have been so obtained in Britain. Speechly was the first cultivator in this country who increased, to any extent, the varieties of the Vine, and this he did, both, as he informs us, p. 2 of the *Treatise on the Cultivation of the Vine*, by obtaining different varieties from various parts of the globe, and also by originating young vines from seeds. They are also multiplied by layers, cuttings, grafting, budding, and from eyes, when the intention is to increase good or well-known varieties.

Seed.—To ensure success, in obtaining superior varieties, it is positively necessary that attention be paid to artificial impregnation; and much of this depends on the sorts made choice of, and the object aimed at, which we may safely suppose to consist in adding to the flavour of such as are already of large growth, or the increase in bulk of those that are of superior flavour. The Frontignans are proper to use when increase of flavour is wished to be obtained; the Muscats, Syrian, and White Nice, when to have large berries, or bunches, is the object in view. Speechly long ago observed that, "All sorts of the Frontignan grapes are proper to add an excellency of flavour to other kinds; but there is a superior richness in the Black, Blue, and Red Frontignans; and they do not partake so much of the strong Muscat flavour [which some object to] as the White and Grizzly do. But it must be considered that the Blue Frontignan grows close upon the bunch, and therefore is only proper to be coupled with the loose-growing kinds that have long footstalks. The White Muscat of Alexandria produces large, loose-growing bunches; and the berries being very large and well-flavoured, it must be a proper kind to be coupled with many others." From the following kinds crossed, good sorts might be expected:—viz., the Grizzly Frontignan and Black Damascus; the Flame-coloured Tokay and Red Frontignan; the White Sweet Water and White Muscat of Alexandria; the White Muscadine and Black Frontignan; and the St. Peter's and White Muscat of Alexandria, &c. Speechly gives the following directions for selecting and sowing the seeds:—"The grapes for seed should be permitted to remain on the plant until they are perfectly ripe, as the seed is not till then quite matured, and when it generally is of a very dark-brown colour. As soon as the seed is taken from the pulp, or flesh, of the grapes, it should be laid on a sheet of paper or the like, in some airy but shady place, to dry, and then carefully preserved till spring. If, however, the seed were to be immediately sown, and the pots kept in the hot-house, and moderate waterings given them during the winter, the plants would rise and come up in spring; but the great disadvantage attending this method is, that the plants would be liable to come forward too early, and of course come weak; for although the seed would lie dormant during the winter, notwithstanding the artificial warmth of the hot-house, yet, as soon as the days begin to increase, and the sun to regain his force, the genial warmth of his rays will soon, and perhaps too soon, bring them up." He concludes that the end of February or the beginning of March is the proper season to sow them. Light, rich, sandy soil is preferred, and eight or ten seeds in each pot, buried to the depth of half an inch. The pots should be plunged into a hot-bed of moderate warmth; and as soon as the plants appear, water must be given, at first sparingly, but when they have attained their proper leaves, and have advanced to the extent of three or four joints, it may be increased; and at this time they should be transferred to single pots. Their culture, after this, differs not from that of Vines raised from eyes or cuttings. Vines so raised will in general produce fruit in the fourth or fifth year.

LAYERS.—The propagation of the Vine by layers, although subject to many objections, is nevertheless the mode in most general use; and while so many cultivators content themselves with large and strong-looking plants, without examining the state of their roots, it is not likely that nurserymen will be at the extra trouble, and somewhat additional expense, of propagating plants by other, although better, means. So averse are we to Vine plants thus raised, that we would much rather pay ten times the price for plants originated from single eyes than for those propagated by layers, however strong or well-established they may appear to be. We will therefore pass over this method of propagation by merely stating that the process differs not from that of other plants so increased.

CUTTINGS.—The Vine is often propagated by what is called *long* cuttings, and also by *short* cuttings. The former are from twelve to eighteen inches in length, and consist of young wood fully ripened, having a joint or two of the old or preceding year's wood at its base. This is the sort of cutting recommended by the earliest authors, and adopted in the formation of vineyards all over the Continent. It agrees, also, with the description of the vine-cuttings of antiquity,—namely, that when complete, they have the appearance of a little mallet. Cuttings of this description are usually planted in autumn, and root freely with or without heat, and often produce fruit the first year. They are planted so deep in the ground as to leave only two eyes above it.

There is another species of vine-cutting called the *short* cutting, which consists of only one eye on the young, or one-year-old wood, and a few inches of the preceding year's attached. These make better plants than can be produced from layers, but are still also inferior to the method of growing them from single eyes, which only should be practised.

SINGLE EYES.—This mode was discovered by the Rev. Mr. Mitchell, a friend of Speechly's, about 1777, and was successfully practised by that eminent horticulturist during the latter part of his life. It is much approved of by all intelligent and observant modern vine-growers. On the advantages of eyes over the other modes of propagation, Speechly, in his *Treatise on the Vine*, p. 52, reasons as follows:—"It is allowed that cuttings are preferable to layers, and that plants raised from small cuttings commonly make the best plants. The cause seems obvious: viz., that it appears injurious to the new plant, in proportion as it partakes too abundantly of its original or mother plant. Hence it is evident that the less the matter that forms the rudiment of the new plant the better. Indeed, this theory is evinced by practice; for it is well known that those plants raised from seeds, which have the smallest beginning, always make better plants, and are greatly preferable to those of the same species which are raised either from cuttings or layers. Plants raised by this method [that is, by single eyes] are greatly preferable to those raised by cuttings in the common way, as they have much more abundant roots, grow shorter-jointed, are more prolific, and will, if permitted, come into bearing the second year." This is unquestionably the best method of propagating the Vine, as we have had ample opportunities of judging, both from our own success and from observations made on the practice of others.

In selecting the wood from which the eyes are to be taken, it is necessary to observe that only that which is of moderate growth, well-ripened, and having well-formed and perfect eyes, should be chosen. Too strong wood is to be rejected, as it contains too much pith, and is seldom so well ripened as that of more moderate size. The buds, or eyes, are also, in strong wood, less perfectly formed; and wood ripened under glass is always preferable to such as has been produced on the open walls. The particulars necessary to form a good cutting, according to Speechly, are principally these:—"1. The eye, or bud, should be large, prominent, and bold; 2. The shoots should be moderately strong, round, and short-jointed; 3. The texture of the wood should be close, solid, and compact, but the best criterion of its maturity is its solidity, and having very little pith." At the pruning-season, select, therefore, shoots of the above description; cut them into convenient lengths, each having one bud or eye; preserve them till the planting-season, which is usually in March, by sticking them in mould, either in pots or a spare melon or cucumber-bed, where they may enjoy plenty of air, and be protected from frost. The process of preparing the eyes is as follows:—"Let the upper part of the shoot be cut sloping, with a sharp knife, about a quarter of an inch above the eye; and at about three inches below the eye, cut off the wood horizontally. Great care, however, should be taken to leave the wood smooth at the bottom: the upper part, too, should be taken off with a clean stroke. As each joint affords one good cutting, a few shoots, about one foot long, will afford you a great choice. The cutting being ready, make a hole with the finger, or by thrusting a small dibble down between the mould and the side of the pot, into which let the cutting be carefully inserted, and so placed that the eye may admit of being covered about a quarter of an inch deep." The cuttings, being so planted in light, rich mould, and from three to eight into each pot, placing them round the edge of the pot in preference to the centre, should then be plunged into a slight bottom heat in a frame or pit. Care must be taken that the heat be not too powerful, so as to draw up the young shoot too slender; and plenty of air should be admitted, for the purpose of starting the plants strong. As the plants increase in size—say to about the height of six inches or so—they should be carefully taken out of the pots, and planted into separate pots, of about four inches in diameter, one plant in each. Some cultivators plant the eyes into pots singly at first, and at this period of their growth shift them into larger ones; but in whichever way this shifting is done, care must be taken not to injure the roots, which are very tender, and, if injured, would materially check the growth of the plants. During their growing season, which will extend from the end of March or beginning of April, till the middle of October, care must be taken that a steady temperature be maintained, and abundance of light and air admitted to them, as well as a liberal supply of water over the leaves, given in the evening, so as to maintain a humid atmosphere around them during the night; and, as they extend in growth, they should be supported with sticks to prevent their being broken. When the wood ripens in autumn, they should be cut down to one eye, and plunged in a dry frame or pit, from which frost is excluded, till the March following, when they should be taken out of the pots, the mould shaken from the roots, and be repotted in pots six inches in diameter, in light, rich soil, and plunged into a mild hot-bed frame, supplied with water and air, till they have attained the height of a foot or eighteen inches, when they will require to be shifted into pots a foot in diameter, and set in a vinery or pine-stove, being placed as near to the glass as possible, and kept in a temperature of from sixty to seventy degrees of heat, where, if supplied with plenty of water, and trained to the trellis under the roof, they will extend to the length of from twenty to twenty-five feet in the course of the season. We have sometimes, instead of training them while in pots in the above manner, planted them out into the border where they are intended to remain, about June or July, at which time they will have attained the height of three or four feet; and have had them reach the top of the rafters the same season, and produce good crops the season following.

Grafting.—This method, although highly recommended by some, is, in our estimation, both uncertain and useless, unless in cases of a house already furnished with vines; and in such it is difficult to introduce young plants, without injuring those already established. Speechly speaks highly of this mode; and Knight, Braddick, and others, have laid down rules for performing the operation. The former of these two last found grafting most successful when the lower part of the graft consisted of two-year-old wood; and the latter, in a communication in the *Transactions of the Horticultural Society*, says, " that he is confident in stating that healthy vines may be successfully grafted with young wood of the preceding year's growth, from the time that the shoots of the stocks which the grafts are to be put upon have made four or five eyes, until midsummer, with every prospect of the grafts growing, and without the least danger of the stocks suffering by bleeding. They may also be grafted with shoots of the same summer's growth, worked into the rind of the young wood, from the time that the young bunches of grapes become visible on the stocks till July, out of doors, or till a month later under glass. The operation must not be performed later than the periods here specified, because time is necessary for the young shoots of the graft to ripen before winter."

Budding.—Unless for particular purposes, this mode of propagation is nearly useless in general practice. The process may be performed in the usual way, upon the young wood, or upon that of the preceding year's growth, with complete success.

Coiling.—This is a mode of propagation which has been recommended by various cultivators of late years. It consists simply in selecting a shoot of the preceding year's growth, several feet in length, and placing it, in a coiled or spiral form, within a large pot, leaving only one eye or more above the surface of the mould. If Speechly and others be correct in the theory, that the smaller the portion of wood employed in the production of a young plant the better, this practice must be quite erroneous. As for ourselves, we can see no advantage attending it, nor have we met with one individual who has tried it but is of the same opinion.

Time of Planting.—Until the time of Speechly, the Vine was planted, like all other deciduous plants, at some period between the fall of the leaves in autumn and the germination of the buds in spring; and, indeed, the same practice has been pretty generally followed since. We think, however, that the Vine should only be planted when in a state of full vegetation: that is to say, that plants excited early in spring in pots, should be planted in their permanent situation about June or July.

Soil.—Switzer, Hill, Lawrence, and Speechly, were correct in their ideas as regards soils for the Vine. Most modern authors, however, have erred in recommending both too deep borders and too rich or strong soils, particularly for such as are grown in the open air. The former of the above authorities says, "The soil should be light, having a bottom of chalk or gravel, under a surface of about two feet, and free from springs. It cannot be too hot or dry." The latter observes, "The soil in which I have known the Vine to prosper in the most superlative degree, without artificial aid, was a kind of rich, sandy loam, intermixed with beds of materials like jointed slate or stone, so very soft in its nature as almost to be capable of being crumbled between the fingers. Strong and deep lands, most suitable for tillage, are the least so for Vines." The greater part of the vineyards in France are on soils argil-calcarious, sometimes primitive, as at Dijon, and also secondary, as at Bordeaux. Around Nismes and Montpelier, where the celebrated Vins de Grave are produced, the vines grow on an argillaceous gravel; and the vineyards of the Rhine are all planted upon thin soils, and upon rocky foundations, but sparingly covered with soil. Retentive clays, as Mr. Loudon observes, are the worst soil for the Vine: the flowers are in great part abortive; the fruit, if it sets, does not ripen; the shoots not ripening well, are more easily affected by frosts; and the fruit is without colour, and flavourless. Deep soils, however rich, are worse than useless, and, indeed, highly improper, if upon a damp subsoil. Vines intended to be ripened in artificial temperatures require a richer soil than such as are to ripen in the open air; but even in such cases, many have erred in making the borders too deep. An excellent vine-border may be formed upon an impervious and dry bottom, and of two feet in depth, and composed of light, rich, loamy earth, enriched with very rotten manure, ground bones, and lime. It is much better to extend the border in breadth than in depth, for the nearer the roots of all fruit-bearing trees are to the surface the better; and as the roots of the Vine are disposed to extend to a great distance from the stem, such borders should not be less than eighteen or twenty feet in breadth.

On this subject Mr. Rogers, of Southampton, offers the following rational observations:—"The Vine, like all other fruit trees, grows most luxuriously in rich, deep soils. In that it has large shoots, leaves, and perhaps a few large bunches; but the shoots and fruit ripen later, if they ripen at all, and the fruit will be very insipid. In opposite circumstances these results are reversed. In a shallow, light soil, the growth is moderate, the shoots are small although not weak, the bunches numerous, well-ripened, and of high flavour. The shoots or young wood are also thoroughly hardened, having prominent buds, and break with vigour and high health in the following year. It is also well known that the roots of the Vine, in order to have healthy, moderately-sized shoots, and high-flavoured fruit, require a horizontal range more or less extensive; deriving, it seems, much benefit from the influence of the air and heat of the sun, when near the surface. If these opinions are well-founded, it is matter of wonder to see what some authors have advised respecting the formation of vine-borders. Vast accumulations of the richest soils and manures are mixed together as if for the gross-feeding drum-head cabbage, rather than for the delicate-feeding and abstemious grape vine, which in its native habitation is content to climb upon and subsist by what it can draw from the interstices of the naked rock."

The same authority proceeds to direct the formation of vine borders as follows :—"In the first place it is absolutely necessary that the bottom of a vine-border be dry, and, if possible, hard as well as dry. If the subsoil be clayey, it should not be dug into to give depth, because such excavation is apt to become a receptacle for water, unless this is prevented by efficient drainage. If a vine-border must needs be made on such a subsoil, it is better to raise the border by bringing upon it an additional quantity of proper soil, than gaining depth by breaking into the natural subsoil when there is the least risk of being annoyed by superfluous water."

Hoare, in his treatise on the Vine, justly observes that, "The natural soil which is most congenial to the growth of the Vine, and to the perfection of its fruit in this country, is a light, rich, sandy loam, not more than eighteen inches in depth, on a dry bottom of gravel, stones, or rocks. [It is to be observed here, however, that this author is alluding to vines grown in the open air.] One of the principal causes of grapes not ripening well on the open walls in this country, is the great depth of mould in which the roots are suffered to run, which, enticing them to penetrate in search of food below the influence of the sun's rays, supplies them with too great a quantity of moisture: vegetation is thereby carried on till late in the summer, in consequence of which, the ripening process does not commence till the declination of the sun becomes too rapid to afford a sufficiency of solar heat to perfect the fruit."

The case is, however, somewhat different in regard to vines grown under glass, because the cultivator has a complete command of temperature, and the Vine, under the influence of fire heat, requires a much greater quantity of moisture, both at its roots and over its leaves, to counteract the effects of fire heat, which is an unnatural element for any plant to grow in. Borders, therefore, for vines to be grown in hothouses, should be rather deeper and richer than such as are intended for the open air. Much evil has arisen from vine-borders, even under these circumstances, being made too deep, and also from the soil being both too rich and of too strong a nature. Few borders require to be of greater depth than two feet, resting upon a dry subsoil; and the more elevated these borders are the better. Indeed, it may be taken for a pretty general rule, that the bottom of the borders of all vineries should be level with the general surface of the garden, or nearly so.

PRUNING.

"The chief object," says Mr. Hoare, "in pruning a vine, is to increase its fertility, which is effected by cutting out the superabundant wood which it annually produces, and adjusting the number and length of the branches that are to remain, to the capacity of the plant for the maturation of its next crop of fruit, and for the production of future bearing wood. The necessity of this operation will appear evident when it is considered, first, that the shoots of a vine which bear fruit one year, never bear any afterwards; secondly, that those parts of the shoots that grow in the latter part of the summer are not sufficiently ripened to produce fruit; thirdly, that a great number of shoots, including those that push from the bases of the buds, and which are thence called lateral or side shoots, are too small, and otherwise unfit to produce fruit; and, fourthly, that a vine in vigorous growth and under judicious management will annually produce a much greater number of buds than would bear fruit in the following year, if retained, than it can possibly bring to perfection. To get rid, therefore, of all this useless and superabundant wood, the operation of pruning must be resorted to; and if the excess is very great, the pruning knife must be exercised in a corresponding severe manner, in order to restore the balance betwixt the roots and the branches. From these considerations it follows, that the judicious pruning of a vine is one of the most important points of culture throughout the whole routine of its management."

A great variety of modes of pruning have been recommended, but they may all be included under three general heads, and these, if properly attended to, and adapted to the circumstances of the case, will answer every useful purpose. These modes are denominated *Long-pruning*, *Spur-pruning*, *Fan-pruning*, of which latter there are many varieties.

THE LONG OR SUCCESSION MODE.—This method may be described as follows:—The Vine at planting is cut down to within a foot or so of the ground; or if planted as already noticed, in June or July, and if fruit be not required the following year, this pruning will be performed in or about February following the time of planting. One shoot only is allowed to proceed from each plant, and this, at the end of the first season, is cut down to the second or third eye. The year following, two leading shoots are encouraged, the strongest of which is headed or stopped when it has extended a few joints beyond the middle of the house or rafter, and the weaker when about half that length. In autumn these shoots are reduced, the strong one having four or five joints cut from its extremity, and the weaker one to the third eye from its origin. In the third season one leading shoot is laid in from each of these, the stronger one throwing out side shoots on which the fruit is produced, which side-shoots are allowed to mature one bunch of fruit each, and are topped at one or two joints above the fruit. No side-shoots are allowed to proceed from the weaker shoot, but it is laid in to produce fruit the ensuing season, so that by the third season after planting, the lower part of the house is furnished with a crop of fruit from shoots proceeding from wood of the preceding year. At next winter pruning the longest of these main shoots is shortened about eighteen inches from the top of the rafter, and the next in strength to about the middle of the rafter, and all the spurs which had borne fruit are removed. Each vine is now furnished with two shoots of bearing wood, a part of old barren wood which has already produced fruit, and a spur near the bottom for producing a young shoot the following year. In the fourth summer a full crop is produced, both in the upper and lower part of the house, the longer or oldest shoot producing fruit on the upper part of its length, and the shorter on its whole length; from this last, a leading shoot is laid in, and another to succeed it is produced from the spur near the bottom. At the next season's pruning, the longest or oldest shoot, which has now reached the top of the house, is entirely removed, and replaced by that which was the next in succession to it, and this in its turn is also cut out and replaced by that immediately behind it, a succession of a yearly shoot being obtained from the lower part of the old stem. Great success has attended this mode of pruning in vineries and stoves, and if the theory laid down by Hoare be correct, there can be little doubt but it is one of the best modes practised, or some other mode, founded upon the same principles, and perhaps adapted in a modified degree to suit local circumstances. The theory laid down by the above author is briefly this,—"That the old wood of a vine, or that which has previously produced fruit, is not only of no farther use, but is a positive injury to the fertility of the plant. The truth of this remark depends on the fact that every branch of a vine that produces no foliage, appropriates for its own support a portion of the juices of the plant that is generated by those branches that do produce foliage. To prove this fact, and to make it as clear as possible, it will be necessary to describe briefly the process by which the life of a vine is sustained, and its parts annually nourished.

"The first movement of the sap in the spring takes place in the branches, and lastly in the roots. The buds, in consequence of the increasing temperature of the air, first swell and attract the sap in their vicinity. This fluid, having lain dormant, or nearly so, throughout the preceding winter, becomes gradually expanded by the influence of the solar rays, and supplies the buds with nourishment from the parts immediately below them. The vessels which yield this supply becoming in consequence exhausted, are quickly filled with fluid from the parts below them, and in this manner the motion continues until it reaches the roots, the grand reservoir of the sap, by which time, the solar heat having penetrated the soil, the roots begin to feel its enlivening influence. The whole body of sap then begins to move upwards, and as soon as the quantity propelled is more than sufficient to distend all the vessels in the stem and the branches, the buds begin to elongate and unfold. From this time, the fluid becoming more expanded every hour, its ascent is simultaneously increased in force and velocity. The vessels in the branches being filled to repletion, the buds quickly open, and shoots and leaves rapidly protrude. The leaves attract the sap as soon as it reaches their vicinity, and by one of the most wonderful processes that can be conceived, the result of exquisite organization, elaborate and prepare it, and render it fit for the nourishment of all the parts of the plant. The sap being thus prepared is called the proper juice of the plant. It then returns downwards betwixt the bark and the alburnum, and in its descent is distributed laterally to every part of the plant, until it finally reaches the extremities of the roots. During its descent a considerable portion of it is expended in the formation of a concentric layer of woody substance betwixt the bark and the wood, on every branch, and also on the stem, which layer becomes the new alburnum. Now it is of importance to remember that every branch annually requires this new concentric layer,—that this layer is formed from the proper juice prepared in the leaves,—and that the thickness or thinness of this layer depends on the proportion which the proper juice bears to the number, length, and size of the branches which it has in its descent to covey and feed. If, therefore, the foliage of a vine be strong and vigorous in its growth, and there be no naked branches betwixt the shoots which produce the foliage and the stem, then the proper juice in its descent will deposit on the stem a thick layer, and will also descend into the roots in great quantity. But if there be a great number of naked branches which the proper juice in its descent has to clothe and nourish, then, having to spread itself over a much greater surface, the new layer will be comparatively a thin one, and the surplus left to enter the roots proportionably lessened in quantity. And farther, if the foliage be weak, which is invariably indicated by the shoots and leaves being smaller in size, and sickly in appearance, and the vine contain many naked branches, then the quantity of proper juice prepared in the leaves will be so small in proportion to the demands which in its descent will be made upon it, that a new layer will with difficulty be formed at all, while but a very small portion of the proper juice will be left to descend into the roots. From the foregoing observations, therefore, it appears, that every naked branch of a vine, or one that does not directly produce foliage, diminishes the capacity of the plant for the production of young bearing shoots, inasmuch as it contributes nothing to the growth of the vine, but on the contrary requires to be fed annually with a certain portion of the elaborated juice of the plant, which would otherwise be expended in the enlargement of the diameter of its stem, and thereby the increase of its capacity to mature fruit, and in the extension and multiplication of its roots. Naked branches, therefore, are consumers, but not producers; or, in other words, drones in the hive. If the vine were cultivated for the sake of its wood, the case would be different. The growth and extension of large branches, and the increase of their diameters, would then be the legitimate object in view; but when fruit only is sought, and the operation of pruning resorted to, in order to obtain the largest quantity within the smallest possible extent of a given surface, it is obvious that no description of wood should be suffered to remain in a vine but such as directly contributes in some way or other to the production of fruit. It follows, therefore, that as the sole object in view in pruning a vine is to increase its fertility, the best method to accomplish this must be that which leaves a sufficient supply of bearing shoots on the least possible proportionate quantity of old wood."

It appears in practice that the largest and finest fruit is produced upon vines trained upon the long-pruning system, and also that great regularity may be maintained either upon the open wall or in the vinery. The following mode we have practised with success:—The vines propagated from single eyes are forwarded the first year with all possible care. Early in March following, they are shifted into larger pots, and placed in a mild, moist atmosphere, to break for the production of two shoots, one to be encouraged as a leader, the other to be kept a few inches long, for the purpose of producing a successional shoot to follow the course of the first; and when the principal shoot has attained the length of three or four feet they should be planted where they are to remain, about the end of May or middle of June, and if even as late as the beginning of July, they will make sufficient progress, and ripen their wood before autumn. This is easily attained by heading down the young vine to two eyes or buds. The first shoot is allowed to extend to the top of the house or wall the first year, and in the autumn following cut back to half that length; and from this shoot the crop is to be obtained, and the uppermost bud allowed to extend to the top of the house, but not to produce fruit. The young shoot which issues from the short spur left at the bottom of the vine for this purpose is also laid into the length of rather more than the middle of the space to be covered, leaving the other eye that breaks from it a few inches long only, to produce a similar shoot the season following. When the uppermost half of the first leading shoot has produced its fruit, the whole of that shoot is cut out from the bottom, and is succeeded by that which will then be producing fruit and extending to the top of the house, and this rotation is continued, which affords plenty of young bearing shoots with a very small portion of two-year-old wood.

THE SPUR MODE.—This method is exceedingly simple, and is much practised in pine stoves, where any other mode would occasion too much shade for the pines. It consists of allowing only one shoot to extend from the plant to the greatest distance it is intended to be trained, and from the sides of this stem, young shoots issue, which bear the fruit, and are shortened at from one to two eyes above the bunches. At each winter pruning these spurs are cut off, leaving only one eye or bud to each, and these send out young shoots, which produce their fruit in abundance and of great excellence, but not so large as those from vines trained according to the long or successional mode of pruning.

THE FAN OR IRREGULAR MODE.—This is the most ancient, but has no advantage over the last two. It is much less definite, and retains a much greater proportion of old wood, which should always be avoided.

SEASON FOR PRUNING.—The best period for beginning this operation is when the leaves begin to fall, at which time the sap is in the roots, and there is no danger of bleeding, which would be the case if the process were deferred till spring. Early pruning, it has been asserted, has the effect of producing a disposition in the tree to ripen its fruit earlier; but this, we fear, is little to be depended upon.

SEASON OF PLANTING.—It was the usual practice to plant vines, like all other deciduous trees, during autumn, winter, or so early in spring as to have the operation completed before the plants come into a state of vegetation. Vines intended to be grown upon the open walls may be more properly planted at those seasons; but all vines intended to be grown under glass should be excited in a genial temperature early in spring, and planted where they are to remain after they have attained several feet in growth. This may be very conveniently done, as almost all young vines are grown in pots, so that they may be planted at any season with success. The advantage of planting vines considerably advanced in growth is, that time is gained; a vine often making as much progress in one year when so treated, as others will in two years, when planted in a deciduous state.

DISTANCE AT WHICH VINES SHOULD BE PLANTED.—This must be determined by circumstances. Vines on the open wall should be planted at three or four feet apart, while such as are to be grown under glass will require to be regulated by the mode of training to be followed. In general, however, they are planted so as to have a plant under each rafter, and this distance is sufficient in pine stoves; but for regular vineries they may be planted at half that distance. Some attention should be paid to the kinds; small-growing sorts, like the Muscadines and Frontignans, will require much less space than the Muscats, White Nice, and Hamburghs. It is proper also to observe, not to plant the strong-growing and weak-growing kinds together, for in this case the former would rob the latter of their proper share of nourishment; and where circumstances will not admit of these being planted in separate houses, it will be necessary to divide the border by walls into compartments for each description. Sometimes vines are planted at much greater distances, and in some cases a house is devoted to a single plant, as is the case at Hampton Court; but this mode of planting does not admit of sufficient variety, which is always desirable, particularly where the accommodation is limited. On the open walls vines have been planted at a distance of fifty or one hundred feet apart, and with very good effect. In such cases the stem is trained without branches to the top of the wall, and then a branch is carried under the coping both from the right and from the left, the spurs or young shoots issuing from them being trained in a pendent manner.

PLANTING INSIDE OR OUTSIDE THE HOUSE.—Both modes have their advocates: when vines are planted to be drawn out while in a dormant state, as is generally the case with those trained under the rafters of pineries, there can be no doubt but outside planting is to be preferred; but for such as are grown in regular vineries, then inside planting may be with greater propriety adopted, because the glasses can be removed during their season of rest: but in this case great care must be taken not to plant too deep, and that proper arrangements be made for the escape of the roots under the front parapet wall. When this is not the case, we should decidedly prefer planting outside, that the roots may have full scope to extend themselves, and at the same time be kept near to the surface. In old pineries, where the vines have been planted inside the house, they may be laid down close along the front wall, tied up and covered with mats or fern close to the front wall, where they will experience a sort of winter. But a much better plan is to have the front lights of pineries so constructed as to take out, so as to admit of the vines being brought down and trained under the front wall plate, and fully exposed to the weather, while the front sashes are placed upright over the inside of the front wall, leaving the vines without, and permitting the operations of pine culture to proceed within. Many object to plant vines on the outside, from a fear of their being injured by frost; but if the border be properly covered in autumn with litter, as it ought to be, and the stems protected, nothing need be apprehended on this head. Our practice has uniformly been to plant on the outside, and we have never had cause to regret having done so. Some cultivators consider that the Vine requires no exposure to the cold of winter, and keep them constantly in a high temperature; but such a practice is unnatural, and most injurious to the Vine, as it would be to any other deciduous plant.

RIPENING THE WOOD.—This is a branch of vine culture that requires the utmost attention, for if the wood be not fully ripened, or matured, in autumn, the chance of success in the succeeding year will be precarious. Early-forced vines are certain of being fully ripened in the wood before autumn; but such as are forced late require the greatest care. "If the fruit be not off," says Abercrombie, "by the middle of August, the continuation of fine dry weather, or of the heat dependent on the natural climate, will hardly be sufficient to ripen the wood; and therefore, as soon as the external air declines to fifty-eight degrees, resume gentle fires morning and evening, so as to keep the minimum temperature of the house at seventy degrees. The maximum need not exceed seventy-five degrees in sunshine, for fresh air should circulate at every proper opportunity. Proceed thus till the shoots of the season has ceased to grow, and turn brownish at bottom, and the leaves begin to fall, indications that the wood is ripe, when the first and last are not caused by a deficiency of heat." When there are doubts of the wood ripening, it is much better to apply slight fires early in the season, for if the circulation be once stopped by cold, no means will ripen the wood afterwards.

TIME OF BEGINNING TO FORCE.—This must depend in a great degree on the time the fruit is required. "The best time to begin to force is the 1st of March, if the object be simply to obtain grapes in perfection moderately early. In proportion as the start is accelerated before this, the habits of a deciduous plant, and the adverse state of the weather, leave a greater number of obstacles and discouraging contingencies to intercept final success. Managers, however, who work a number of houses, and who have to provide as well as they can against demands for grapes in early succession, begin to force about the 21st of December, and, successively, in other houses, the 1st of January, 1st of February, and so on. Attempts are even made by bold speculators to lay forward for a crop in March, by beginning to force in August, and getting the fruit set before November: but such labour and expence are often lost. The period of ripening is not early in proportion to the time of beginning. When the course of forcing coincides nearly with the natural growing season, ripe grapes may be cut in five months or less; when short days compose a third part of the course, in about six months: when the course includes full half of the winter, it will last nearly seven months."—*Abercrombie*. The 1st of January is a good period to begin early forcing, but the 1st of February or the 1st of March is the proper season, when the finest crops are to be expected. Small houses are best adapted for early forcing; and, with these and many difficulties to contend with, the Dutch manage to have ripe grapes in March.

Forcing in Pots.—This is a modern improvement in vine culture, and has many advantages; such as producing a very early and also a very late supply, as well as a greater variety than can be otherwise produced in the same space. Almost all the varieties of the Vine will produce fruit in this way; but the smaller growing sorts should be preferred, although we have had Black Hamburghs and Muscat of Alexandria in great perfection. The Black Esperion, Muscadines, Frontignans, Sweetwaters, Burgundy, St. Peter's, &c., are probably sorts which most deserve the attention of the cultivator for this mode of forcing. The pots we used were fifteen inches in diameter; the soil, rich light mould, abundantly supplied with water; and the situation, the back and front curbs of the pine stoves. By this method the early varieties of grapes may be had in great perfection in March and April, and the later and long-keeping sorts, ripening in November, may be kept in a dry airy room, hanging upon the vines till January or February.

Forcing by Dung-heat.—This method was in use at an early period in this country, as the writings of Laurance, Switzer, and Justice inform us, and is still very generally practised on the Continent. The great loss of manure, the expense of management, and, after all, the chances of failure are so great as to render the practice almost obsolete in this country.

Temperature.—The Vine, like all other deciduous plants, should be excited into vegetation in a slow and gradual manner. When the process of forcing is about to begin, the temperature for the first week should not exceed that of the external atmosphere above a degree or two, afterwards it may be advanced to fifty or fifty-five degrees, and in course of a week to fifty-five or sixty degrees, at which it ought to remain till every bud on the vines has sprung. After the sap is in full motion, and the buds expanded, the temperature should be kept at sixty degrees as a minimum, and sixty-four as a maximum, by fire-heat, allowing a rise of three or four degrees from sun-heat. When the blossom expands the minimum should be sixty-six, and maximum seventy-two degrees; and by the addition of solar heat it may be allowed to rise to eighty degrees, giving at the same time abundance of air to strengthen the shoots, and enable the parts of fructification to perform their important office. After the fruit is set, the minimum temperature may be fixed at seventy-five degrees: the Vine after this period will bear a considerable degree of heat, provided it be abundantly supplied with air and water. Some kinds of grapes, the Muscat of Alexandria for instance, will not set their fruit unless in a high and moderately humid atmosphere.

[White Muscat of Alexandria.]

Watering.—Throughout the whole course of vegetation the Vine requires an ample supply of this element, not only at its roots, but also over its leaves and branches. Morning and evening are the proper times for its application, and the garden syringe the proper instrument. Water should also be copiously spilt on the flues and against the walls of the vinery, whence it will rise in genial vapour, and be a substitute for natural dews. At the season of the buds breaking the application of water in this way is indispensable, as it softens the bark and the covering of the buds, and enables them to break stronger and more regular. During the period while the vines are in blossom, and until the fruit be set, syringing must be discontinued, and the required humidity kept up by steaming; after this time, until the fruit begin to colour, it should be resumed, both for the nourishment of the vines and the suppression of insects.

Manure.—Although the Vine luxuriates in a rich soil, and requires it for the production of the weighty crops it carries, still manure in a rank state is exceedingly pernicious to it. No manure should be used at [its roots until it be completely rotten to mould, or applied in a liquid form, diluted with water. Mulching the borders with good rich dung may be occasionally used, as by this means the essence of the manure is washed down to the roots in a gradual manner.

Summer Pruning.—This operation consists in selecting such shoots as are to be encouraged for the production of fruit the following season, as already noticed in treating on the subject of pruning upon the long-shoot principle. These shoots are to be carefully secured to the wall, or trellis, at their full length, until they have extended as far as required, when they should be topped at about four or five joints above where they are to be cut back to at the winter pruning. Such as are trained after the spur fashion are to be topped at the first or second joint above the fruit, and all other shoots removed close to where they issue from the older wood. Those trained in the fan, or irregular form, require to be topped at the same distance above the fruit as the last, and all other shoots that are not required to fill the space intended to be covered, as well as a supply of young wood to admit of an annual reduction of the old, are to be entirely removed. The same routine is equally applicable to trees on the open walls, as well as to those grown under glass.

Insects and Diseases.—The Vine is subject to few or no diseases, for if it be planted in a proper soil and climate it will live for ages. The vineyards in Italy are in many cases so old, that the date of their formation is unknown to their present owners. Miller tells us of vines being three hundred years old, and that in the wine countries vines of one hundred years' growth are considered young. And to such magnitude do they grow, that they have afforded timber enough in the stem to make a statue of Jupiter, and columns in Juno's temple. The great doors of the cathedral at Ravenna were made of vine tree planks twelve feet long and fifteen inches broad. Pliny mentions a vine six hundred years old, and at Econa, a country seat of the Montmorenci family, is still shown a table, of large dimensions, made of the wood of this tree. In our country, vines have attained a great age, as may be instanced in those at Hampton Court, Valentines, and Northallerton, the latter recently destroyed, which in 1582 was then one hundred years old.

The insects which infest the Vine are chiefly the red spider, invited by too dry an atmosphere and too high a temperature. Of course the opposite mode of treatment may be considered the best remedy. Two or three species of the genus *Coccus* sometimes attack the Vine, but these can be got rid of when it is without leaves, as the stems and wall or trellis can then be well washed with soap and water.

Birds and wasps attack the fruit in the open air, but these can be excluded by covering the trees with thin bunting or gauze, and in the vinery by covering the opening for ventilation with similar materials. The green-fly often attacks the foliage in spring, but the usual remedy of fumigation with tobacco, if persevered in, will completely eradicate it.

THINNING THE FRUIT.—This is an operation in culture which should not be neglected, either on the open wall or in the vinery, as much of the size, flavour, and beauty of the fruit depends on this practice. The first thinning should commence when the bunches are showing, at which time it is necessary to disbud the vines, that is, to remove every shoot which does not produce fruit, unless it be required to fill any particular space for improving the tree, as well as to disencumber it of superfluous shoots and fruit. No spur should be allowed to carry more than one bunch of the ordinary-sized sorts, except some of the smaller kinds, which may occasionally be allowed to carry two. The next thinning begins after the fruit is fully set and formed, and consists, first, in lessening the size of the bunches by removing a portion from the bottom as well as from the points of the shoulders. Many of the market-gardeners round London content themselves with this mode of thinning, as it economizes time, and reduces the bunches to a moderate size, which, in general, are more convenient for the purchasers. Gardeners who are ambitious of fine large bunches follow a different plan. Instead of reducing the size of the bunch, they rather increase its dimensions by suspending the shoulder with threads from the branches or trellis, and then cut the berries with a pair of fine-pointed scissors, reducing the number of berries, particularly towards the centre of the cluster, to admit air, light, and sun, both to colour them and to give them room to swell to a larger size. By this process the weight of fruit is not diminished, as what is lost in the number of berries is more than made up in weight, in consequence of the increased size of the fruit. A third and last thinning should take place partially just before the fruit has attained its full size: this thinning is more to regulate the form of the bunch, or to thin any particular part that may be more crowded than the rest; but it should be performed some days before the colouring commences, for after this the fruit should not be handled.

RETARDING MATURATION.—When grapes are required during winter this is a necessary process, and may be easily effected where there are many vineries. The first principle of retardation depends on a proper selection of such sorts as have the property of ripening late, and also of hanging long on the tree after they have attained maturity. Of these the most proper are the White Muscat of Alexandria, Black Damascus, Black Raisin, Black Teneriffe, St. Peter's, Syrian, White Nice, and Black Hamburgh. These must be grown in a separate house by themselves, and one that is used alternately for pines and grapes is the most proper. If about the middle of February the pines be removed to another house, the grapes which may remain on the vines should be all cut, if not already consumed; the house should then be thrown open, so that the vines may be as much exposed to the air and cold as possible, in which state it should remain till the end of April. At this period the buds will begin to swell, when gentle fire-heat should be applied at night, and in cold frosty days; but the thermometer should not be allowed to rise beyond sixty-five or seventy degrees. About this time the house may be again filled with pine plants, which may remain subject to the usual routine of culture till the month of November, when they may be removed, as the water necessary for their growth would cause too humid an atmosphere for the grapes to keep in. The house should, from this time till the fruit of the vines be all gathered, be kept dry, and at an equable degree of temperature, say sixty or sixty-five degrees; when the fruit is gathered, throw open the house as above. By this late and slow process these sorts of grapes will not ripen before October; and the very late sorts, like the St. Peter's, not till near Christmas, and will keep fresh till January, February, or March, if required.

Vines grown in pots, treated in a somewhat similar manner, will afford a long succession of fruit; and by the time they are fully ripened may be removed into a light, dry, and airy chamber, from which frost is completely excluded, and thus allow the house they were grown in to be filled with early-ripening sorts, or otherwise used, as may be most convenient. Grapes may be kept a considerable time on the tree after they are ripe if the houses they are grown in be properly glazed and water-tight, for without this all the ingenuity of man cannot long preserve them from rotting. In ordinary cases, when it is desirable to keep the crop beyond the usual period, the vineries should be kept dry and cool, and the borders covered with dry coal-ashes, decayed granite, or trap; the leaves round the bunches should be picked off, and every thing having a tendency to damp or decay removed. In damp weather a slight fire should be made, and free ventilation attended to. A correspondent in *Horticultural Transactions* informs us that he preserves grapes in his vinery till February, by lighting slight fires in the day-time and giving plenty of air; but the fires are extinguished in the afternoon, and the house shut up. "The fire in the day," he says, "aided by the circulation of air, renders the whole interior of the house perfectly dry, so that no damp exists in them when shut up; a night fire, on the contrary, with the houses closed, creates a vapour, which causes the fruit to become mouldy and to decay." The late Mr. Braddick, in the last-quoted work, covers the floor of his vineries, in autumn, about three inches thick with coal ashes; which, by preventing any damp from rising, to mildew or injure the fruit, enables him to preserve the grapes hanging on the trees in a very perfect state till the end of January, or later. In the large vineries at Hampton Court the grapes are preserved till the beginning of January, by keeping the house dry and removing the foliage after it has completed its office for the maturation of buds for the succeeding season. The floor of this house is covered with stone pavement, and the glass is in good repair; so that slight fires and free ventilation keep the atmosphere dry and wholesome. Grapes are often preserved by separating them from the tree, taking a portion of the shoot on which they grow along with each bunch: the ends of these shoots are covered with sealing-wax, and the bunches suspended from a line in a dry room, observing that such berries as begin to decay be speedily removed. Forsyth practised packing the bunches in jars amongst bran or dry sand, excluding the air by covering the mouth of the jar with a bladder, and setting them in a room where a constant fire was kept during damp weather.

Growing Grapes in Pine Stoves.—Many object to this mode of culture, and contend that the shade of the Vine is injurious to the growth of the pine. This opinion we think erroneous; and so satisfied are we of its incorrectness, that we would plant vines to be trained under the rafters of all pine stoves, if it were only for the partial shade which they afford, and which we think rather beneficial to the pine than otherwise, besides the great economy in space, fuel, &c. The finest grapes that were ever produced were grown in this manner.

CONSTRUCTION OF THE VINERY.—Much has been advanced upon the construction of the Vinery, chiefly as regards its dimensions, heating, ventilation, and form; and, as a consequence resulting from such a diversity of opinions, many extravagant, and we may say useless, structures have been erected. The vinery, as Dr. Neill has justly remarked, "is susceptible of a great variety of form; and, indeed, in this respect, seems more pliable than any other forcing-house. That form, however, which has been most commonly used, is the plain roof, with sliding sashes: and such is the success with which it has been employed, and such its convenience for every purpose, that it is not probable it will soon be generally supplanted." Since the time of the great Boerhaave and Miller, the correct angle which the roof of hot-houses should present has been matter of controversy. The former laid down a rule that all glass roofs should be perpendicular to the sun's rays at the shortest day, when most heat and light are required: the latter prefers two angles in the roof, one as the upright glass, to meet the winter's sun nearly at right angles; and the other, as the sloping-glass, to meet him at an angle of forty-five degrees for summer use, and the better to admit the sun's rays in spring and autumn. Since their time Knight, Williamson, and others, have been engaged in similar experiments; the former of these prefers, in forcing-houses, such a slope of roof as shall be at right angles with the sun's rays at whatever season it is intended to ripen the fruit. The latter prefers an angle of forty-five degrees for all houses, and this angle appears to be the most popular among practical men. The great majority of cultivators, and ourselves amongst the number, pay little respect to this matter, considering that a few degrees of angle either the one way or the other is of far less consequence to the end in view than than either good borders, proper temperature and ventilation, and decidedly far less than rational and common-sense practice and management. The late Mr. Atkinson, whose friendship we long had the honour of enjoying, and who studied practically in his own garden the theory and practice of hot-house building, confined himself to no particular angle in the numerous hot-houses he erected through Britain; but always maintained that good borders, good management, and a proper regulation of heat and ventilation were all that was required. His houses were usually built to about an angle of forty-five for early forcing, and rather flatter in the roof when late crops were required. He also preferred small to large houses, in which opinion we think most cultivators will agree. His houses were, in general, from thirty to forty feet in length, ten feet high, and twelve feet wide, (we take the dimensions of those built by him for their Graces the Dukes of Bedford and Buccleuch as examples,) and quote the descriptions of the former from Mr. Forbes's excellent work, the *Hortus Woburnensis.* "The front wall consists principally of piers that are carried up from the foundation at three feet six inches apart to the ground level, where they are connected together by a flag-stone about two inches thick, extending from pier to pier in order that the roots may not be too deeply buried in the border, which is frequently the case when these arches are constructed of brick-work: above the ground line, or flag-stone, fifteen inches of brick-work is carried up for the wall-plate or sill to rest on that receives the front lights, which, together with the wall, leaves the front of the vinery about three feet nine inches high above the ground level of the border. There are also piers built in the interior for the support of hot-water pipes, which are arranged parallel to the front wall, about twenty inches distance; a space reserved for planting the vines in, which are placed close to the wall, and their roots extend under the pipes, and also through the arches, to the exterior borders. The interior width of the house is twelve feet in the clear; a pit is made in it for forming a bed of leaves and dung, to produce a moist heat for assisting the bursting of the buds. These pits, when filled with fermenting substances, are very useful for the acceleration of strawberries, French beans, figs, or even pines; any of which may be brought to perfection in this department without injuring the grapes. The roof of this range is also constructed of cast-metal, copper, and wood." We ought here to observe, that Mr. Atkinson was not an advocate for metallic roofs in this case. The Duke of Bedford, and his intelligent gardener, Mr. Forbes, wished to give a fair trial to these roofs, as they would have an opportunity of testing them with the wooden roofs of other houses at Woburn. "The rafters, wall-plates, and spouting, are all cast metal; the frames of the lights are composed of wood; and the astragals, or small bars, of copper; which combination of materials forms a very durable, light, and elegant roof. The front sashes are all made to open outwards, which is done by means of a pivot, and fastened on the outside by a key, so as to prevent their being blown open by the wind. The lower tier of roof-lights are all fixtures, and only every alternate sash in the upper range is made to run, in order to admit air. There is also a ventilator placed under every alternate or fixed sash of the top tier, which communicates with the openings in the top of the back wall, whereby a free current of air may be admitted into the house in wet weather, without sliding down any of the sashes: in short, a free circulation of this element may be, at all times, admitted, by opening these ventilators and the front lights, which, except in very sultry weather, will be sufficient to keep the temperature of the vinery as low as it may be required. Each of the moveable lights is furnished with a chain and small winch, which draws them up with the greatest facility. The trellising is of iron rods, about a quarter of an inch in diameter, and is placed within nine inches of the glass roof, or lower end of the rafter, and about twelve inches from it at the top." The hot-water boiler, by which these houses are heated, is fixed in a niche in the back wall, and the pipes proceed across the end of the house, under the floor level, to the front, where they run parallel to the front wall, and are either connected with a reservoir at the end farthest from the furnace, or turn with an elbow joint, and return again to the boiler, when the cold water enters near to its bottom, and when heated again rises to the top pipe, and so flows on as long as the fire is maintained, or, indeed, while any heat remains in the brick-work round the boiler.

All vineries should stand at least two feet above the general level of the ground, and have a border in front from fifteen to twenty feet in width. The intention of thus elevating such houses is, that they may be more effectually rendered dry at the bottom, and also to give them a bolder and better appearance. The breadth of border recommended above is much greater than is usually considered necessary; but it is better to have broad and shallow borders than narrow and deep ones. Indeed it should be taken as a general rule, that the bottom of all hothouse borders for fruit trees should be just level with the general line of the surrounding ground. They may either gradually slope from the front of the house to the walk, or may be carried out nearly level, and faced in front with a low parapet wall. In regard to heating, there can be no doubt but that hot water is at once the cheapest and best. There is scarcely a chance of houses so heated being rendered too warm, and the temperature is rendered much more equable than by steam, or any other mode. The atmosphere must be much more pure, as no noxious gas or sulphureous smoke can possibly enter into it, which is not the case when smoke-flues are used, let them be ever so well built and maintained. Any kind of fuel may be used to heat the water; no other fuel but coal can be applied to smoke-flues. The hot-water pipes, when properly filled, can scarcely go wrong; they require no annual repair, they occupy much less space than any kind of flue does, and the temperature can be much longer maintained at the proper heat than with any other mode of heating: for fires made up at eight o'clock at night seldom require to be attended to till seven or eight next morning. Where two houses are to be heated, and are connected together, one fire and boiler will sufficiently heat both. In this case it should be placed in the middle between both, and the pipes made to branch from the right hand out from the left. When one only is to be heated, by having a stop-cock in the pipe the heated water will circulate in one only, and when this is removed, or opened, the circulation will flow through both. This is of much importance, as it saves the expence of two stock-holes, which are not very pleasant objects to see in a garden; it abridges the number of chimney-tops, too, and, consequently, the quantity of smoke, which is not only injurious to all plants, but soon renders the hot-houses dirty and unsightly.

While on the subject of heating by hot water, we will give the experience of Mr. Forbes, as exemplified in the gardens at Woburn Abbey; and this we are the rather induced to do, from hearing, since we came to Scotland, so many doubts as to the capability of obtaining sufficient heat by this means:—"In the forcing-houses at Woburn we can heat," says Mr. Forbes, "a compartment, in which the boiler and pipes together contain one hundred and twelve imperial gallons of water, to one hundred and thirty-two degrees in the boiler, in forty minutes from the lighting of the fire, and to one hundred and fifty-two degrees in one hour; and that without consuming more than three-fourths of a bushel of coal." When water is heated to one hundred and fifty-two degrees, it was considered by the late Mr. Tredgold and others to give out its caloric more freely than when at a higher temperature.

"In another house here, the boiler, pipes, and reservoir contain one hundred and ninety gallons. The boiler has been filled when the water was at forty-five degrees, the fire lighted, and in the space of one hour the temperature of this quantity of water has been raised to one hundred and ten degrees in the boiler, and to ninety-eight degrees in the reservoir, which is fifty-eight feet distant from the boiler, the fuel consumed being only half a bushel of coals. In the course of two hours, the water in the boiler was increased to one hundred and thirty-eight degrees, and in three hours its temperature increased to one hundred and sixty-six degrees. The fuel required to raise it to the last-mentioned degree was simply one bushel, which would be sufficient to keep an ordinary-sized house warm enough for twenty-four hours, in the severest weather, when once set a-going. The thermometer in the reservoir indicated twelve degrees lower temperature than that in the boiler, which may readily be accounted for, by being fifty feet apart, and farther from the immediate action of the fire. The advantages which these large pipes have over those of less dimensions, is, that when the great body of water is once heated in them, they will retain it for a number of hours, without requiring any additional fuel supplied to the boiler, or attendance; whereas, the shallow pipes, if not constantly attended to, and the fire kept playing under the boiler, will soon become cold. It must, therefore, become obvious, that the small or shallow pipes require a far greater attendance, and infinitely more fuel, than those of more capacious dimensions."

The following data as regards the size of boilers, and the space that they are capable of heating, may be useful:—" The boilers at Woburn are twenty inches deep, and about eighteen inches broad, and two feet long. The return pipe is four inches in diameter, and the upper or conducting pipe measures twelve inches over and four inches deep: it contains double the quantity of water that the lower pipe does, and gives out a much greater degree of heat, being sufficient to keep up a high state of temperature in an ordinary-sized house. The largest compartment here, allotted to the boiler and these said pipes, contains about five thousand and sixty cubic feet of air, and one thousand and eighty superficial feet of glass, which is more than we generally find heated by a single fire or flue in a forcing-house." Of course this is calculating for a house for late forcing, but the following may be considered the proportions for one adapted for early forcing. The dimensions of boiler and pipes above specified, " should not have to heat a greater space than three thousand or three thousand five hundred cubic feet of air."

The foregoing observations may be considered as an appendix to the article " Heating," in the 2nd Volume of " THE FLOWER GARDEN,"— " THE GREENHOUSE," in which the subject of heating is treated on at some length.

FORCING VINES IN MORE HUMBLE EDIFICES.—In many parts of the Continent, and even in some few instances in this country, vines are forced in very humble edifices. The Dutch, Flemings, and Germans use pits, often not exceeding three or four feet in depth. These are sometimes heated by dung or tan being placed within them, which give out a mild, humid heat, serviceable to the Vine while the buds are breaking; and this, with the proper husbanding of the solar heat by judicious ventilation, is often found sufficient to produce ripe grapes at an early period. Other instances occur of such pits being heated by a smoke flue, to which very moderate fires are applied. But what is most novel in these pits is, the vines being planted outside, the wood that is to produce the fruit is trained under the glass within, while the young wood for succeeding crops is allowed to grow without, where, under a brighter sunshine than we enjoy, the wood becomes perfectly ripened, and when the crop is gathered, the old wood, or that which produced fruit this year, is entirely cut out and replaced with the young wood hitherto growing without the pit. Vines are also ripened on the Continent, by having glass frames placed against the wall on which they grow, about the time the fruit is half or three parts swelled, at which period those glasses are not in use which have been employed in forcing early crops of melons, salads, &c. The solar heat collected by this contrivance ripens the fruit well, and fully matures the wood for the following season. We have it in contemplation, founded upon the success of this mode, which we have often witnessed on the Continent with admiration, to erect a portable structure in the new gardens now preparing for his Grace the Duke of Buccleuch, at Dalkeith Palace, and of which the following brief description will convey a sufficient idea:—Supposing a south wall, built hollow and heated with hot water (as all our walls are to be), be planted with the early ripening sorts of grapes, late peaches, and some of the best late ripening plums, such as Coe's Golden Drop, &c. The trees not to be excited in spring (which should never be attempted with hot walls), but rather retarded in their blossoming by keeping the branches as far from the wall as possible till they begin to blossom, at which time they are to be laid in to the wall and the blossom protected with thin canvass awnings, particularly during night. In July, at which period the roof-sashes of the early forced peach-houses and vineries will be removed, these are intended to be employed to cover the above wall in the following manner. A permanent stone curb, twelve inches high or more (or a wooden plank of the same height will answer as well), is laid along parallel to the bottom of the wall and at two feet distance from it. This curb is furnished with a groove, an inch and a half deep and three inches wide, to receive the bottom rail of the sashes, the top rail to run in a corresponding groove in a batten of wood fixed to permanent brackets near the top of the wall, the distance between the top and bottom grooves to be equal to the length of the sashes, the bottom rail of each sash to be furnished with two brass rollers, to facilitate their movement. The glasses, it will thus appear, will stand perpendicular to the wall, and at two feet from it, and ventilation and the necessary operations of pruning, gathering, &c.,

can be carried on from without, the lights being made to pass each other in the grooves, as in the manner of what is called barrack windows. The concentration of solar heat in August, September, and October, with the power of applying fire heat by means of the hot-water pipes in the walls, which may be safely used as soon as the glasses are put, will not only ripen our best autumn fruits, but also mature the wood and buds for succeeding crops. Grapes and plums may be prolonged by this mode, we think, till Christmas, or indeed until the glasses be required to be again put on the early forcing-houses; and our finest Flemish pears, late peaches, and nectarines, which do not often ripen well in England, on the open walls, and never in Scotland, will be brought to the highest perfection. Hot walls we have long ago proved to be of little or no value in spring, but their efficacy in autumn no one can doubt, and their utility will be greatly increased by having this covering of glass before them.

[White Muscadine Grape.]

INSTRUMENTS OF OPERATION

USED IN THE FRUIT-GARDEN.

THE following instruments are used in the practice of orcharding, many of which are indispensable, while others are more adapted to the use of amateurs than of the practical cultivator.

KNIVES.—These are of three kinds, viz., the pruning-knife, grafting-knife, and budding-knife.

There are two kinds of pruning-knives,—the common pruning-knife with a sheath, and the pruning-knife with a folding blade. The former consists of a blade of steel fixed without a joint in the handle, and is kept in a sheath of leather or pasteboard; it is carried in a side-pocket on the thigh for safety and convenience. The blade is much straighter than that of the common garden gathering-knife; because, as all knives cut on the principle of a saw, a hooked knife is injurious when it is used to cut woody shoots; therefore, wherever a clean cut is of importance, the straight-bladed knife should be used, and not the garden-knife with a hooked blade. The latter is exactly similar to the former in form of blade, but differs from it by folding into the handle, and is therefore more portable.

The grafting-knife differs from the last two in being thinner and more narrow in the blade.

The budding-knife has the sharp edge of the blade rounded off in the same manner as the back or blunt edge of the grafting and pruning-knives. It differs also from them in having a thin wedge-shaped ivory handle for lifting up the bark in the operation of inserting the bud. A variety of this knife, with a heart-shaped end to the handle, is approved of as being better adapted for opening the bark. This variety is called Godsall's budding-knife.

CHISELS.—One variety of chisel is sufficient for all purposes in fruit-tree culture, and that known as the grafting-chisel is the best. This chisel differs from the carpenter's chisel in being a narrow wedge, tapering equally on both sides. It is used to split stocks when they are too strong for the pruning-knife. It is also used for amputating large branches of wall-trees when the saw cannot be conveniently applied.

Saws.—The saw best adapted for pruning fruit-trees is a blade of steel three times as thick as an ordinary saw, and serrated or toothed in what is called the double manner on one side, and is either jointed like the folding pruning-knife, or without a joint like the common knife. Large branches only should be taken off with the saw, and when the amputation is effected the wounds should be smoothed over with the pruning-knife, and covered with any substance that will exclude the wet and air until the bark grows over it.

Shears.—The use of shears as a pruning implement is now very properly exploded from modern practice, in this country at least; but there have been several useful instruments invented which may be said to hold an intermediate place between the shears and the knife, for while in appearance they somewhat resemble the former, their operation is performed upon the principle of the latter. The first of these is the

Averruncator, of which there are several varieties. They consist of a compound blade attached to a handle from five to eight feet in length, and operating by means of a lever moved by a cord and pulley. It is a useful pruning instrument, and by means of it the pruner can shorten or take off branches of a considerable size ten or fifteen feet from the ground, and by using steps even to a much greater height. This instrument is exceedingly valuable in the case of standard trees, which are not easily pruned, and therefore too often neglected, owing to the difficulty of reaching the extremities of the branches. With this instrument the pruner can walk round the tree, and select such shoots as his judgment suggests should be either shortened or cut out altogether. It may also be advantageously used in thinning out the young shoots of standard trees, which not only rob the tree and fruit of a great share of nourishment, but also shade the fruit, and prevent a free circulation of air from passing through the trees. These shoots usually die themselves from want of air, and give the trees an unhealthy appearance, and also often lay the foundation for canker and other diseases not readily remedied.

The Pruning-shears, of which there are several varieties, in some degree resemble the last, but differ in their mode of cutting from the common shears by having a moveable centre for the motion of one of the blades, by which means they make a *draw cut* instead of a *crushing cut*, leaving the section of the part attached to the tree as smooth and firm as if cut with a knife. They are convenient for the same purposes as the averruncator, but are much stronger, and therefore better adapted for removing branches of large size. The strongest sort of them will cut off a branch two inches or more in diameter.

The Ringing-shears is an instrument seldom employed. They are used for ringing the bark of fruit-trees, with a view to increase their early bearing. A two-bladed knife, with both blades open at once, is a much better instrument.

BARK-SCARIFIERS, OR SCRAPERS.—Of these there are several kinds. The following are the best, and therefore most generally used. Their use is to remove the outer epidermis, or hard decaying external bark, from fruit-trees of great age; they are generally hooked edge-tools, or blunt knives, and vary in size and form according to the size of the trees to be operated upon: in general, they are in form like an inverted gouge, and cut or scrape by drawing the instrument inwards, instead of the gouge, which cuts by pushing outwards. The moss-scraper is used for standards when they become infested with various species of mosses, and resemble a horse curry-comb, which, indeed, is an excellent substitute for it: For the smaller branches of wall-trees a scraper, in form of a small reaping-hook, is used. An old, half-worn, hard scrubbing-brush, kept wet with lime-water, urine, or any alkali, is a much better instrument for this purpose. The blunt knife, a double-edged lance-shaped instrument, is used for cutting out decayed wood from hollow wounds in old or neglected trees. A carpenter's gouge is an excellent substitute.

HAMMERS.—Of these there are various varieties, to be purchased at the seed-shops: the best sort is the forked-claw hammer, having the head deeply indented with transverse grooves, which lessens the chances of its slipping off the head of the nail. It has also a stud of about an inch in length, protruding from the head in a direction with the handle, which serves as a fulcrum in drawing nails out of the wall, and guards small branches from injury by the pressure. The handle should be short, not more than nine or ten inches in length.

LADDERS are of six sorts, the orchard ladder, the step ladder, the wall-tree ladder, the three-styled, the forked, and the double ladder.

The Orchard Ladder is a commodious and mechanical combination of two or more ladders, according to the height desired to be reached. It consists of a frame mounted on low wheels, by which it can be easily moved from place to place, and which forms a basis for several ladders which fit into each other, and are capable of being hoisted up by machinery. They are useful for gathering the fruit or pruning lofty standard trees.

The Step Ladder. Such ladders have a fulcrum or back, by which they stand nearly perpendicular, and independent of any other object. This fulcrum is removeable at pleasure, being kept in its proper position by two iron bars, which, when removed, fall back on the ascending part. The steps in such ladders are flat, instead of round, as in most other ladders, and hence are less fatiguing to the feet of the operator.

The Wall-tree Ladder differs only from common ladders in having two iron studs, from ten to twelve inches in length, projecting at right angles from the upper end, which are intended to support the top part, and to prevent injury to the trees, as well as to allow the operator to prune or nail at the top of the wall as well as elsewhere. These studs are often of wood, but as that material takes up more space, it is more liable to bruise the branches than when iron studs about one inch in diameter are used. The ladders have sometimes flat steps, at other times round ones; the former are the best: they should also be made as light as possible.

The Three-styled Ladder differs not from the last, only is without studs, and supported in the desired position by a pole which is fixed to the top, and acts like the fulcrum of the step ladder. It is useful for gathering the fruit and pruning moderately-sized standard trees.

The Forked Ladder is a primitive-looking machine, being no more than a naturally-formed forked portion of a tree, the extremity of the limbs forming the resting part on the ground, and the united piece resting against the wall. The steps are formed by nailing pieces of wood across. This sort of ladder is seldom used, and we think should be expelled from every garden.

The Double Ladder differs from the step ladder only in having two ordinary ladders fixed together at the top upon an iron axle, the one acting as a fulcrum to the other.

THERMOMETERS.—The instruments for determining temperature in general use are the common thermometer, which is too well known to requre any description, and Six's registering thermometer, Bregazzi's hot-house thermometer, and Bregazzi's bark-bed thermometer.

Six's Registering Thermometer is a valuable instrument, indicating the extreme points to which the thermometer falls or rises in the course of any given time.

Bregazzi's Hot-house Thermometer has a double back, which, when suspended from the roof of the hot-house, prevents the sun heat from acting on the back of the bulb, a current of air passing between the two backs.

Bregazzi's Bark-bed Thermometer is an instrument intended to determine the temperature in bark beds, water, mould, &c. The bulb is enclosed within a painted glass tube, and when plunged to the required depth indicates the heat on the visible part of the glass, which is protected with a thin metallic case, having a small opening near its top, and protected by a small door.

Fruit Gatherers.—These are of many sorts: the most useful, however, are Saul's fruit gatherer, Lane's fruit gatherer, the peach gatherer, the pear gatherer, the berry gatherer, and orchardist's hook. These are described and illustrated by cuts in the *Ency. of Gard.*, from which the following brief description of them is chiefly taken.

Saul's Fruit Gatherer "consists of a pair of cutters attached to a long pole, which may be lengthened by screwed joints or otherwise. The operating lever may be attached to any part of the pole; the lever of the moveable blade has a spring under it, to keep it open, and the communicating spring passes over a pulley; the cutters are so connected to the pole by a joint and arch, that they may be set at any angle required, for the purpose of getting at the fruit readily. Half the top of the basket [which is placed under the pulley and cutting part, for the reception of the fruit] may be covered, to prevent the fruit from falling out when a full basket is brought down."

Lane's Fruit Gatherer "consists of a pole with a pair of forceps at the end, one limb being fixed, and the other moveable; a wire is attached to the moving limb, which passes along a groove to the trigger. The pole being held by the left hand, the back of the right raises the trigger and opens the forceps, which being applied to the fruit, the trigger is pressed, by which the fruit is secured. The forceps are formed of a ring of metal, covered with soft leather, and padded."

The Peach Gatherer "consists of a tin funnel, or inverted hollow cone, fixed to the end of a rod or handle, at an obtuse angle. The funnel is first introduced under each fruit, and then gently raised or moved sideways; if ripe, the fruit will fall into it. It is used for gathering the peach tribe, apricots, and plums.

The Berry Gatherer is formed of a pair of scissors and pincers combined, is worked by the hand like common scissors, and is sometimes used for gathering gooseberries, strawberries, and raspberries.

The Grape Gatherer resembles a pair of scissors, tweezers, or pincers combined, attached to the end of a long rod, and wrought by a cord, which, when drawn tight, presses one limb of the pincers, which opens them, and when the cord is slackened, they shut close by means of a spring, and sever the fruit-stalk from the vine, while it holds it tight till brought down to be reached by the hand.

The Orchardist's Hook. The orchardist's hook consists of a light rod, with an iron hook at one end of it and a piece of wood made to slide along it. In using it, the fruit gatherer takes hold of a branch with the hook, and having drawn it sufficiently near him to be able to gather the fruit, he fastens it in that position by hooking on the sliding piece to another branch. This slider passes freely along the rod, but cannot fall off on account of a pin which passes through the rod at its bottom end.

Of all these fruit gatherers the last, although the simplest, is the only one of real utility; and whatever may be said in their praise by those interested in the disposal of them, we must class them among the number of horticultural toys, of which the present age affords a pretty extensive catalogue.

SYRINGES OR WATER ENGINES.—Of syringes there are several, but those most adapted for fruit-tree culture are Read's and M'Dougal's—the first certainly the best implement of the kind. Its superiority consists chiefly in its having a ball valve which can never get out of repair, and this is the part of all others that generally gives way first. This syringe also has a small tube by which the air escapes in the operation of drawing in water, and this space is as readily replaced with air through the same tube in pressing the water out again, thus greatly lessening the labour of working it, as the air above the siphon proves an obstacle to the operation of the syringes in common use.

M'Dougal's Syringe differs from Read's in some internal arrangements, and in having a bent tube made to screw on the end of the syringe, which, like Read's, is straight in the barrel. This bent tube is intended for washing the under-side of the leaves of trees. This instrument may be either used as an inverted syringe, or changed into a common or straight syringe, at pleasure.

The Barrow Water Engine is a very useful machine for watering wall and standard fruit-trees. It consists of a cistern capable of containing from twenty to thirty gallons of water, mounted on a wheelbarrow, which may be wheeled to any part of the garden. In this cistern a small force-pump is fixed, which will throw the water to a distance of fifty or sixty yards. Read's newly-invented barrow engine is the best, and the least likely to get deranged.

ARTICLES OF ADAPTATION.—These are also of various kinds; the most useful are the following:—

Oiled Paper Frames consist of light frames of wood, about four feet wide and eight or nine feet long. Cross bars are mortised into the sides, and intersected with pack-thread, forming nine inches square. Common printing paper is pasted over them, and washed with boiled linseed oil. These frames are useful for protecting early blossoms, ripening melons, &c., over dung beds.

Net Screens are formed of old fishing-nets, sometimes fixed to the walls over fruit-trees to protect the blossom, and afterwards the fruit. One description of net covering is described in the *Hort. Trans.*, vol. iv., as consisting "of two deal poles, on which a netting of common fishing-net, previously dipped in tanners' bark, to prevent its mildewing when rolled up wet. At the top the ends of the poles fit into double iron loops, projecting a few inches from the wall, immediately under the coping; and at the bottom they are fixed by a hole at the end of each pole, upon a forked iron coupling, which projects about fourteen inches from the wall, thereby giving the screen a sufficient inclination to clear the branches. When it is wished to uncover the trees, one of the poles is disengaged and rolled back to the side of the other, where it is fastened as before. The most violent winds have no injurious effects upon shades of this kind; a wall is very expeditiously covered and uncovered, and there is not any danger of damaging the blossoms in using them; they occupy very little space when rolled up, are not liable to be out of order, and, although rather expensive at first, seem to be very durable.

Canvass, oil-cloth, gauze, woollen nets, or bunting screen may be used in a similar manner. Bast mats and straw coverings have been used for like purposes, but they are both expensive and troublesome in their management.

ARTICLES OF MANUFACTURE.—These are nails, list, nailing bags, of all of which there are many varieties.

Wall-tree Nails should be small-headed cast-iron nails, as being better to drive into the walls, and also much cheaper. The reason for using small-headed nails is, that there is much less chance of the bark being injured by them, which often grows into nails having large heads, and causes gum and canker to arise from such wounds. In driving the nails, we may here observe, they should be driven in a slanting direction, so that the head of the nail may stand as far from the branch as possible, in order to avoid this evil. Cast-iron nails, when taken out of the wall at the winter nailing, are very commonly cleaned and rendered almost as good as new by being burnt in an iron pot, boiled in a strong solution of corrosive sublimate, or thrown into a clear fire in a hot-house furnace and sifted out of the ashes.

Lists.—These are used for going round the branches of wall-trees, to enable them to be nailed to the wall. The best are the selvages of broadcloth, cut into lengths and breadths to suit the size of the branches to be fastened to the wall. Fragments of cloth are also used for the same purpose. Insects find shelter in woollen lists, which has induced some persons to steep them, previous to using, in a mixture of soap-suds and tobacco; while others, with more apparent good reason, steep them in a solution of corrosive sublimate; while some reject them altogether, and use narrow slips of leather, twine, and small willow twigs.

The Nailing-bag is an indispensable article in wall fruit-tree culture. It should be made of leather, in form of a large pocket, for holding the nails and shreds, and two small pockets over it,—one for holding a knife, and the other a sharpening-stone. One leather belt should be attached to it, with a buckle, to suspend it over the shoulder of the operator, and another to go round his body.

To obviate the necessity of nailing trees to the walls, which in all cases is very injurious to them, recourse has been had to trellising them with wire; and also by fixed permanent studs, with an eye in them, to which the branches are fastened.

In regard to trellising garden walls, the idea is good, although by no means of modern invention. It has been long practised in Holland, and also in many gardens in this country. The advantages are many: such as the preservation of the wall, the greater facility of fastening the branches of the trees to it, and the admission of a free circulation of air round the branches and fruit. This latter advantage is perhaps the greatest, as it must improve both the ripening of the wood and the fruit, and render the trees less subject to the effects of those sudden transitions from heat to cold, which all wall-trees, particularly on southern exposures, are liable to during the spring months. Rain, as well as water supplied by artificial means, will be more beneficially applied to them than if they were nailed close to the wall; and insects will not only be more easily subdued, but will find much less protection, and infinitely less convenience for depositing their eggs, than in the crevices between the joints of the brickwork, or the innumerable holes formed by the annual process of nailing. The trees will be retarded in producing their blossom in spring, and thereby escape the destructive spring frosts, which often, in the space of a few hours, blight the hopes of the cultivator for a whole season.

All walls, we would say, should be trellised, were it for no other reason than their preservation. Such as are built of flints, mud, reeds, and stone, should be so, for the facility of fastening the branches to them.

Strong wire only ought to be used for such trellising, and may either be of iron, brass, or copper. The former is the cheapest; and, if painted over with some anti-corrosive composition while new, before it begins to rust, and occasionally afterwards, will last for many years. Brass would last the longest, but the expense places it beyond general adaptation. Copper is more durable than iron, and may be considered the best of the three.

The distance such trellises should be placed from the wall is difficult to specify. For vines and figs, they will require to be from seven to ten inches distant from the wall, and from fifteen to twenty inches apart from each other. For pears and cherries, whose leaves are smaller, they may be from six to nine inches from the wall, and from twelve to fifteen inches apart from each other. For peaches, apricots, plums, &c., whose leaves are still smaller, from four to eight inches from the wall, and from six to nine inches apart from each other. It is to be understood that we mean the wires to run longitudinally, and not perpendicularly.

ON COLOURING GARDEN WALLS, WITH A VIEW TO FORWARD THE RIPENING OF THE FRUIT.—Several writers, in the *Transactions of the Horticultural Society*, and other works on gardening, have recommended colouring the walls of gardens of a dark colour, generally black. The philosophy of this doctrine is good so far, as it has been known since the days of Newton that black bodies have a greater affinity for heat than white; consequently the advocates of this theory were correct in stating that a black wall would be warmer than a red or brick-coloured one, and still more so than one built of white free-stone, with copious joints of white mortar.

This theory has been reduced to practice in many instances. The effects are (so far as relates to our present subject), that the trees planted against such coloured walls, produced their blossom earlier (in some cases by a day, in others several) than such as were planted against walls not coloured. The consequence follows:—A sharp morning's frost comes, and cuts off the bloom of such trees, and with it the hopes of their owner, while he has to console himself with the idea that it is well he had not coloured all his walls, for on such as are uncoloured he finds, in the end, that, if they did not produce the blossom so soon by a few days, by this very circumstance they have escaped the frost, and he has an abundant crop.

On the subject of painting wooden walls, we may be allowed to remark that it is not fully ascertained whether such walls will last longer by being covered with paint, coal tar, or any similar coating, or not. This is a subject which involves too much scientific knowledge, perhaps, to be detailed in a work merely practical; and also would require more space to elucidate than we have to spare in this work. We will, however, remark, that if timber be properly seasoned and dry at the period it is painted, we think there can be no doubt of its adding to its durability; but if it be not so, if it be recently felled, and containing a great portion of its natural sap, if it be allowed to become charged with moisture, from lying in a damp situation, or exposed to rain, and in that state painted, we think that painting will be injurious. As the paint is intended to resist, or keep out humidity—the cause of decay—it will have a similar effect in keeping in the moisture which the timber may have imbibed; and which, not having the means of escape, will rot the timber under the paint.

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